Attitude toward, knowledge and use of the "sensible drinking" message and unit-based guidelines in University students: a mixed-methods approach

By

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DECLARATION

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I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature:……

Contents

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Summary

This thesis present three studies that aim to investigate and compare different definitions of standard drinks and alcohol intake recommendations worldwide and explore University students' knowledge of, attitudes toward, and use of unit-based guidelines in the UK. Excessive alcohol consumption is associated with a range of economic, social and health problems. Heavy drinking patterns among University students are well documented. Like most developed countries, the UK government introduced the "sensible drinking" message and guidelines for alcohol consumption to encourage people to reduce their drinking.

The first study was a review of official definitions of standard drinks and guidelines of 57 countries. Analyses showed a lack of international consensus in terms of the size of "standard drinks" or recommended daily or weekly maximum alcohol intake. The results suggested that a global system of units and low risk drinking guidelines could help people make better-informed choices about alcohol consumption and help consistency among researchers, health professionals and governments developing public health initiatives.

The second study used an online survey to examine the multivariate correlates of motivation to use guidelines and accuracy of estimates of alcohol consumption among 640 students aged 18-37. Results showed that motivation and ability to accurately estimate the unit content of beverages were linked to various cognitive and behavioural variables such as conscientiousness and extraversion, familiarity with, and frequency of use of the guidelines and perceptions of how easy and useful the unit-based guidelines are.

The third study employed semi-structured interviews in a sample of 12 students selected from the second sample. Thematic analysis revealed that participants were not motivated to adhere to the guidelines and lacked skills to apply them to manage their own drinking. Findings suggest that multifaceted public health interventions should include provision of information, efforts to motivate young people to change their behaviour, and strategies to develop skills for managing alcohol consumption.

Chapter 1

General Introduction

Alcohol has been a part of human culture for thousands of years, and in many countries worldwide is a common feature of social gatherings (Hanson, 1995; Babor, 2010). Alcohol is considered as one of the most abused drugs all around the world and in particular in developed countries (Foster & Marriott, 2006; Mohapatra et al., 2010). Despite our understanding of its intoxicating, toxic and dependence-producing properties, the industrialisation of production and globalisation of marketing and promotion of alcohol resulted in a global increase in the amount consumed and the harms associated with it – prevalence of health and social problems – in almost all societies that consume alcohol (Rehm et al., 2009). In the UK, around 9 million adults drink at levels that pose some risk to their health, with 2.2 million drinking in ways that put them at higher risk of harm (Public Health England (PHE), 2014).

The relationship between alcohol consumption, health and social outcomes is complex and multidimensional. Some research has identified beneficial effects of specific drinking patterns on the incidence of diseases such as diabetes and ischaemic cardiovascular outcomes (Puddey et al., 1999; Rehm et al., 2003). However, such beneficial effects are outweighed by the generally detrimental effects of alcohol consumption, which is still considered as one of the major avoidable risk factors for chronic diseases (e.g., cirrhosis of liver, cancer, diabetes, neuropsychiatric disorders, cardiovascular disease) and injury (Foster & Marriott, 2006; Rehm et al., 2009; Rehm et al., 2003). The World Health Organisation (WHO) describes alcohol misuse as one of the leading risk factor for disability, morbidity and mortality. It is also considered as a component cause of more than 200 disease and injury conditions (WHO, 1992). According to the organisation, 5.9% of all deaths worldwide were attributable to alcohol consumption in 2012, and alcohol use results in about 3.3 million deaths each year (WHO, 2014).

Alcohol consumption is linked to well-recognised risks for the drinker of avoidable adverse outcomes such as being involved in accidents, violence and crime, long-term health problems including medical conditions such as heart failure, and social consequences (Balakrishnan et al., 2009; Lee & Forsythe, 2011; Office for National Statistics (ONS), 2015; Scarborough et al., 2011; Rehm et al., 2009, Rehm et al., 2003; Room et al., 2005). The harm originating from alcohol misuse can also have substantial effects on others beside the drinker, and the negative consequences of excessive alcohol use in such situations include: injuries and deaths from traffic accidents; aggression and crime; antisocial behaviour; harm from interpersonal violence; harm to families comprising domestic violence and divorce (Anderson & Baumberg, 2006, Anderson et al., 2009; Gmel & Rehm, 2003). The Crime Survey for England and Wales 2012-13 revealed that almost half (49%) of all violent crime is related to alcohol. This is the case in over two-thirds (69%) of stranger violence and one-third (38%) of domestic violence incidents.

Negative consequences of heavy drinking for both the drinker and others result in high economic costs to the health care sector and to society. The alcohol-related social costs has been estimated at about 233.5 billion dollars in 2006 in the United States of America (Bouchery et al., 2011), 125 billion euros in the European Union for 2003 (Anderson et al., 2006), and 21 billion pounds in 2009 in the United Kingdom of Great Britain and Northern Ireland with the NHS incurring £3.5 billion a year in costs related to alcohol (HM Government, 2012; PHE, 2014; WHO, 2014)

1.1. Young people's drinking trends

Alcohol is part of the social lives of people of all ages (Szmigin et al., 2008) and in many Western countries, governments have implemented alcohol harm reduction strategies to encourage citizens to drink responsibly and minimize alcohol-related harm. However, these strategies predominantly target young people who have globally been identified as a group more likely to drink excessive amounts of alcohol (Babor et al., 2010; Niland et al., 2013). Strategies for alcohol harm reduction usually focus on the risks associated with excessive or binge drinking, hoping that in

mobilizing an ethos of personal accountability to protect personal health and welfare, people will not drink to excess (Jayne et al., 2011; Niland et al., 2013). However, research shows that such risks are often perceived as irrelevant by young adults who instead emphasise the sociability, release, pleasure and fun of drinking. Friendship is a central part of their lives and an integral part of their drinking experiences (de Visser et al., 2013; Niland et al., 2013). To improve the efficacy of the alcohol harm reduction strategies, it would be beneficial to further explore young adults' drinking as a shared social practice that is pleasurable and undertaken within friendships. Some authors argue that young adults' drinking is linked closely to the intimacy of bonding with friends in the fun and adventures of nights out together (de Visser et al., 2013; Niland et al., 2013). In many cultures, especially for young people, drinking alcohol is "essentially a social act" (Douglas, 1987, p.4); its meanings inhere within different socio-cultural contexts as rituals that mark out work and leisure time, identity and status, boundaries of inclusion and exclusion, and shared communality.

Previous research on the meanings of alcohol use for young people shows that their drinking is fundamentally about pleasure, which involves fun, enjoyment, feeling good, relaxing, having a good time, a good laugh, and being sociable (Fry, 2011; Lyons and Willott, 2008). Pleasure is social, involving friends planning and getting ready for a night out (Szmigin et al., 2008) and experiencing the bodily pleasure of being drunk, which stimulates a collective sense of fun of socialising together (de Visser et al., 2013; Fry, 2011; Niland et al., 2013). MacLean (2016) found not only that alcohol use is a social activity frequently involving friends but also that young people's levels of alcohol consumption are heavily influenced by those around them and that alcohol use practices and patterns are transmitted between friends. Drinking alcohol together generates intimacy which enables people to constitute friendships (de Visser et al., 2013). Making sure that their drinking is in accordance with what of their friends is perceived as a demonstration of friendship. Sharing common stories and posting pictures of drinking antics on social media is a way to affirm friendships. The connection between alcohol use and friendship-

making practices can provide a better understanding of young adults' alcohol use (MacLean, 2016). However, evidence from qualitative studies suggests that young people's drinking is quite nuanced, and that it depends on context and drinking patterns and also reflects family background, life stage, previous experiences with alcohol and socio-economic circumstances (Harnett et al., 2000; Herring et al., 2013; Piacentini & Banister, 2006; Bradby, 2007; Mullen et al., 2007; Seaman & Ikegwuonu, 2010).

As mentioned above, young adults are usually perceived as a group more likely to drink excessively . However, recently some countries have seen a decrease in alcohol consumption in young people. A report exploring the recent trends in Australia alcohol consumption found that between 2001 and 2013 an increase of report of lifetime abstention from alcohol occurred in the Australian population (Foundation for Alcohol Research & Education, 2015). This was due to the increase of abstainers in the younger subgroups of the population, with the largest shift occurring among the 14-17 year olds. Furthermore, the report showed a decline of drinking 5 units or more among adults aged less than 40 years old (Foundation for Alcohol Research & Education, 2015). A similar phenomenon has been observed among adolescents in the UK. It was reported that in 2013, 9% of pupils aged 11 to 15 years old had drunk alcohol in the last week, compared to 25% in 2003 (Health and Social Care Information Centre (HSCIC), 2014). Furthermore, another report showed that later in life, 21% of adults reported not drinking alcohol at all in 2013 (HSCIC, 2015). This shift is explained by the increasing proportion of young adults (18-24 years old) who decide not to drink alcohol. The proportion of adults who binged at least once in the last week (defined in the report as drinking more than 8 units of alcohol on their heaviest drinking day for men and 6 units for women) fell from 18% in 2005 to 15% in 2013 (HSCIC, 2015). A report by the ONS (2016) shows that fewer 18 to 24 years old drinkers (48%) reported drinking alcohol in the last week than adults aged 45 to 64 (68%). However, despite being less likely to consume alcohol than the older adults in the sample, young adults were more likely than any other group to drink more than the weekly recommended limit in one

occasion (ONS, 2016). In the USA, the 2015 Monitoring the Future Survey (MFS) – which measures drug use and attitudes among eighth (13 years old), 10th (15 years old), and 12th graders (17 years old) has revealed a gradual decline in alcohol consumption among this population in the last 5 years. For example, 38% of 12th graders said they had been drunk in the past year in 2015, compared to 41% in 2014 and 53% in 2001. According to the 2014 National Survey on Drug Use and Health, rates of binge drinking (consuming 5 drinks or more in a row at least once in the last 2 weeks) and heavy alcohol use have declined among 12 to 20 years old in the US since 2005 (+ ref). A study comparing weekly alcohol use in adolescents (aged 12 to 15 years old) in 28 countries in Europe and North America found a trend in decreasing weekly alcohol use except in some Eastern European countries (e.g., Croatia) (de Looze et al., 2015). The decrease was strongest in Northern European (e.g., Denmark), Southern European (e.g., Italy) and Anglo-Saxon countries (e.g., UK).

Studies of late adolescents and young adults have revealed that when deciding how much alcohol to consume, the pleasure of drunkenness is weighted against the risks it entails and that both pleasure and risk management are embodied social practices (Graber et al., 2016; Zajdow & MacLean, 2014). Young adults' experience of drinking alcohol and intoxication is complex, and many reported aiming for a sensory state described as between being tipsy and drunk. However, this point of perfect tipsiness is not clearly defined and, being one state short from acute drunkenness, young people frequently find themselves more drunk than they wanted to be. The strategies displayed by young adults in order to self-monitor their drinking and manage their drinking within social settings include: drinking water between alcoholic beverages, not mixing different alcohol, refusing drinking shots when offered , actively attending to bodily signs of intoxication and leaving the venue early (Graber et al., 2016; Zajdow & MacLean, 2014). However, participants admit that adopting such measure did not always work in avoiding getting too drunk and that after a number of drinks many abandon this intention. Despite the fact that such strategies are only partially reliable, many young adults do not actually wish to get

intoxicated to the point where they have no control and that they make plans to reduce drinking and the risks to their safety (Graber et al., 2016; Zajdow & MacLean, 2014). It seems that to better understand young adults' drinking practices it is important to have an insight into what they seek from intoxication and how they monitor and manage levels of drunkenness (de Visser et al., 2015; Graber et al., 2016; Zajdow & MacLean, 2014) think these results might reflect an international shift in young adults' drinking practices.

The emphasis in research and public debate and policy is usually put on young adult's drinking to excess but some young people chose to drink little or not at all. Prior research has found a variety of reasons for not drinking including sporting ambitions, religious and/or cultural prohibitions, family history of alcohol misuse, or not liking the effects of alcohol (Bradby, 2007; Herring et al., 2013; Nairn et al., 2006; Piacentini and Banister, 2009). Herring et al. (2013) found that consuming alcohol and drinking to excess is not an automatic rite of passage nor an integral part of growing for young adults in the UK. Drinking lightly or not at all is still perceived as out of the 'norm', but more choose to be a non- or light drinker. Many of the young adults interviewed in this study were proud to be able to resist to the predominant drinking culture. They were socially integrated and developed strategies to manage drinking situations including politely but firmly refusing offered drinks, buying their own drinks, 'mirroring drinks so that people thought they were drinking alcohol or having a 'legitimate excuse' such as driving. They also pursued hobbies and interests where alcohol was not the focus (e.g., sport). However, they complained about a lack of support for their choice and wish that their personal perspective was more respected and considered like a valid choice. The participants who attended university also felt that more effort should go into organising and promoting events where the focus is not on alcohol (Herring et al., 2013). Conroy and de Visser (2014) identified the environmental challenges and peer pressure experienced by non-drinking students. The challenges described included having to justify lifestyle choices and pressure from peers to drink alcohol and having to share spaces where people drink when sober. All participants emphasised the importance of providing

false or misleading accounts of their reasons for not drinking alcohol and made the distinction between not drinking alcohol for socially acceptable reasons (e.g. being the designated driver) and socially unacceptable reasons (e.g. disliking its social effects). The use of such deceptive strategies was often not necessary within closer friendships. Some participants felt more comfortable to declare their non-drinking status from the onset of a social situation. As non-drinkers, participants felt under persistent pressure to drink alcohol among peers. Participants' accounts showed how talking about non-drinking could be experienced as difficult and they faced a dilemma about whether or not to 'come out' (as a non-drinker) or 'fake it' (e.g. 'I'm on antibiotics') (Conroy & de Visser, 2014).

A better understanding of young people's choices and strategies used not to drink could be useful in reducing alcohol harm among young adults in the current consumption culture (Herring et al., 2013). Conroy & de Visser's (2014) findings also suggest that health promotion initiatives that do not include guidance on how to manage perceptions of drinking behaviour and peer pressure are likely to have limited impact in reducing alcohol consumption among students.

1.2. Student drinkers: an at risk group

Prior research has shown that university students represent a group of individuals who have unique drinking patterns and different risk factors and concerns related to problematic drinking than the general population (Ham & Hope, 2003). It is also well documented that alcohol seems to be part of the lifestyle at university: many students often drink above the recommended guidelines for 'low-risk drinking' and they are more likely to do so than their non-student counterparts. Consuming dangerous amounts of alcohol on a regular basis puts them at greater risk for significant negative health and social outcomes (Harford et al., 2003; Hingson et al., 2002; Jackson et al., 2005; Lee & Forsythe, 2011; Office for National Statistics (ONS), 2015). In many countries, excessive alcohol use among students is considered as a major public health concern (Gill, 2002; Jones & Gregory, 2009; Kypri et al., 2005; Quigg et al., 2013).

As for other adults, reported benefits of student drinking include increase in self-confidence and enhanced social life (Orford et al., 2004). However, excessive alcohol consumption is the leading causes of injury and death among university students and young adults (Wicki et al., 2010). Heavy drinking is often defined as exceeding a certain daily amount (e.g., four drinks a day) or quantity per drinking occasion (e.g., four drinks on an occasion, at least once a week) (WHO, 1994). Definitions of specific patterns of heavy drinking can also be found and were traditionally named 'binge drinking' to describe a clinical description of a pattern of problematic alcohol characterized by a period of heavy use followed by a period of abstinence. It was later defined as an extended period of heavy drinking usually over more than one day at a time (WHO, 1994). A more recent definition of heavy patterns of drinking takes into account the potential negative consequences of heavy drinking during a single occasion. Risky single occasion drinking (RSOD) can be defined as having X number of standard drinks or more, on one occasion (i.e., 5 or more) (Gmel et al., 2010).

High levels of alcohol consumption have been found to have adverse consequences for students' studies (leading to poor academic performance), their finances, and their physical and mental health (Bewick et al., 2008; Dodd et al., 2010). Negative consequences may also include: intentional (e.g. assaults) and unintentional (e.g. falls, road traffic incidents) violence, unprotected sex (increasing risks of unintended pregnancy and sexual transmitted infections), relationship problems, financial difficulties and criminal consequences that jeopardize future job prospects (Hingson et al., 2002, Snow et al., 2003; Wechsler et al., 1995). In addition, negative consequences can affect others too. Fellow students can suffer from disrupted study and sleep due to inconsiderate and antisocial behaviour among drinkers, and also physical and sexual assault perpetrated by drinking students (Brener & Collins, 1998; Hingson et al., 2002; Perkins, 2002). Lastly, anti-social and drunken behaviour resulting from students drinking alcohol in excess can also have a negative impact and put pressure on the local health and criminal justice services in the communities where they live (Palk et al., 2007).

There is therefore a need to understand correlates of heavy drinking in students and to develop strategies to counter it.

1.3. Characteristics of student drinking

The existing body of research has brought evidence that many students drink heavily but also that students' patterns of drinking varies greatly and may not be consistent throughout a week, semester, or academic year (Del Boca et al., 2004). Drinking can fluctuate from day to day, in particular from weekday to weekend, with heavy drinking in general increased on weekends. Fridays and Saturdays together account for 60% of all drinks consumed, and Thursdays account for an additional 17% (Maggs et al., 2011).

Students drink more on certain days of the week where they tend to consume large amounts of alcohol in a single occasion, which could explain why the terms binge drinking or heavy episodic drinking (HED), and RSOD have commonly been used to describe the heavy drinking patterns of university students (Black & Mullan, 2015; Goodhart et al., 2003). The prevalence of HED among students has remained stable (Johnston et al., 2009). Although males are more likely to binge than females (Wicki et al., 2010), heavy drinking has been increasing among young women (National Centre for Health Statistics (NCHS), 2005; Tsai et al., 2007). The previously observed difference in prevalence of HED in men and women could be explained by the fact that the ability to drink a lot was perceived by both as being more a 'male' unhealthy behaviour. Men adopt such more manly behaviour (even when unhealthy) in order to maintain or increase their perceived masculinity capital (de Visser & McDonnell, 2012).

Research has shown that full-time university students drink alcohol at higher rates than same-aged non-university young adults (Colby et al., 2009). Around one-third of university students in the USA (33%) and Canada (36%) report at least one occurrence of HED in the previous 2 weeks. Almost half (48%) of students in Australia report one instance or more of HED in the previous 4 weeks (Black &

Mullan, 2015). Extreme binge drinking (described by the authors as drinking 10+ or 15+ drinks in a row) is also a concern, with 11% of students consuming at least 10 drinks per occasion and 5% drinking 15 or more drinks in a row (Johnston et al., 2010; Velazquez et al., 2011).

Many university students experience negative consequences after drinking. In fact, in one study in the USA, almost a third (31.4%) of university students who have used alcohol reported doing something regrettable after drinking, 26.8% reported black out and forgetting where they were or what they did, and finally 15.1% reported physically injuring themselves (American College Health Association, 2010). One study in the UK found that first year students reported consuming an average of 18.9 units (or 151.2g of pure alcohol) per week (males 24.0 units, females 15.4 units): 77% of students reported that their alcohol consumption was having a negative impact on their finances, 48% reported that it was affecting their physical health, and 34% reported that it was impairing their studies (Bewick et al., 2008).

Despite increased enforcement of campus alcohol policies and availability of campus-based alcohol education and interventions, the problem of heavy drinking remains difficult to tackle (Colby et al., 2009). This might be partly explained by university students' attitudes towards alcohol and their perception of their own drinking. Despite experiencing negative consequences they tend not to view their drinking as problematic (Posavac, 1993; Vik et al., 2000) and they attribute less risk to binge drinking than do other young adults (Office of Applied Studies, 2003). Students consume alcohol mostly for social and enhancement motives during social events; and report getting substantial benefits from drinking (Wicki et al., 2010). Students perceive alcohol as a facilitator of socializing, having fun, and intimacy (Nezlek et al., 1994; Park, 2004), while reductions in drinking have been associated with decreased enjoyment and socializing (Murphy et al., 2005). Finally, students (in particular those with higher alcohol consumption) tend to overestimate the extent of their fellow students' alcohol consumption (Colby et al., 2009). These factors and characteristics – gender, drinking motives, and social norms – need to be taken into

account in the efforts to reduce students' heavy drinking and provide better health education and support systems in universities (Colby et al., 2009; Newbury-Birch et al., 2000).

Evidence suggests that binge drinking declines with age (Smith & Foxcroft, 2009). For most students, reductions in drinking often occur after graduation from university, with the acquisition of responsibilities and adult roles such as full-time work, and parenthood (Bachman et al., 1997; Gotham et al., 1997). However, it has also been shown that patterns of alcohol consumption from adolescence and early adulthood are linked to patterns of alcohol use later in life. For example, Jefferis et al. (2005) found that binge drinkers in early adulthood are more likely to be binge drinkers in mid-life.

1.4. Limitations of the concept of binge drinking

The definition of binge drinking has been controversial and some researchers have expressed concerns that the use of this term may misrepresent the scope of the problem of heavy alcohol consumption in university students (Read et al., 2008). For example, this concept does not include other relevant aspects of student's drinking behaviours such as the time period over which a certain amount of alcohol is consumed - consuming 6 drinks in two hours is more problematic than 6 in eight hours (Presley & Pimentel (2006).

To add to the issue of defining HED, a variety of definitions and measurements are currently in use to investigate alcohol consumption, no international and only few national standards have been established to define HED or binge drinking (Gmel et al., 2003).This means that because of culture-related variations and methodological differences reported prevalence and consumption indicators cannot directly be compared between studies (Wicki et al., 2010). In the USA, the following definition of binge drinking is usually used: consuming 5 or more drinks on an occasion (or in a row) for men and 4 or more drinks for women over a period of 2 hours (Office of Diseases Prevention and Health Promotion (ODPH), 2010). In

Australia, the definition is not gender specific and consists of drinking more than 4 Australian standard drinks on an occasion both for men and women (National Health and Medical Research Council (NHMRC), 2012). Binge drinking has also often been described in terms of units of alcohol as drinking more than twice the daily recommended maximum in one day- i.e., eight or more units for men and six or more units for women (Herring et al., 2008).

Furthermore, research on alcohol use and analyses of patterns of heavy drinking among university students are almost exclusively based on research in universities in the US and Canada, and by comparison, few empirical studies have been conducted in universities in Europe (Stock et al., 2009). Questions have been raised concerning the transferability of results obtained in the US and Canada to other drinking cultures and alcohol use in students in Europe because of differences in legal drinking age and drinking cultures (Wicki et al., 2010).

Differences in definitions and limitations in measurement techniques and in drinking cultures mean that the knowledge of students' alcohol consumption has been limited (Greenfield & Kerr, 2008).

1.5. Public health strategies to decrease alcohol misuse

Liberal states have a duty to look after important needs of people individually and collectively as a society (i.e., to provide conditions allowing people to be healthy and take measures to reduce health inequalities). One of the main goals of public health policy is therefore to promote public health and social wellbeing (Anderson et al., 2009). More specifically to addressing the issues of alcohol misuse, alcohol policies can be defined as a number of measures aimed at keeping the health and social alcohol related harms to a minimum (WHO Expert Committee on problems related to alcohol consumption, 2007). Research evidence now exists on the relationship between alcohol and health which should be used as a scientific basis for public debate and governmental policy making. Babor et al. (2010) listed seven main areas within which alcohol policies have been developed.

The **first policy** area is based on the idea that alcohol consumption can be control by monitoring and increasing the price of alcohol through taxes because increasing the price of alcohol will reduce demand. The **second policy** approach is focused on how regulating availability of alcohol – e.g., with restrictions on when and where alcohol is sold - can reduce the total volume consume and alcohol related harm and risks. The **third policy** is based on an approach that aim at creating environmental and social constraints that – using policies and legal requirements - will limit alcohol consumption and reduce alcohol-related violence. The **fourth policy** area is focusing on how to tackle the issue of drink-driving, for example by breath testing drivers randomly and punish offenders more harshly. The **fifth policy** strategy is relying on the assumption that education, and clear and relevant health information (e.g., implementing education programmes in schools) improve people's knowledge, which in return change attitudes towards alcohol and prevent problematic drinking. The **sixth approach** is based on regulating advertising and other marketing of alcoholic products. The theory behind this policy is that reducing young people's exposure to normalized drinking – e.g., ban advertising on TV - will reduce heavier drinking by young people and reduce the number of new drinkers. The **final policy** approach is focusing on heavy and problematic drinkers, and how to care for and treat them best. This policy aims at improving the health sectors' screening system and increasing opportunities to join treatment programmes. The goal is to prevent alcohol dependence by adequately treating alcohol dependence, encourage abstinence and motivate at-risk drinkers to drink in moderation (Babor et al., 2010).

However, what is the most efficient way to initiate and maintain a change in health behaviour in people is yet to be identified. More research could identify which strategies and interventions have demonstrated successful achievement of their public health intentions and which have not. However, much of the scientific evidence is reported in academic publications and the relevance of this information for alcohol policy is often overlooked (Babor et al., 2010).

In the text below, examples will be given to illustrate how certain alcohol measures have been developed and applied in different countries.

1.5.1. Mass media campaigns

Using mass media campaigns is a tool mainly targeting information and education, and addressing harm reduction. They are effective measures to expose high proportions of large populations to messages through existing media. Typical campaigns have placed messages most frequently via television or radio, but also outdoor media, such as billboards and posters, and print media (i.e., magazines and newspapers). Such mass campaigns have been used in an attempt to effect various health behaviours and reach large audiences. They are considered to be a fairly low-cost mean to disseminate various health-related messages in mass populations. They have often been aimed at tobacco use and heart-disease prevention, cancer screening and prevention, sex-related behaviours, alcohol and illicit drug use and many more other health issues (Wakefield et al., 2010). Exposure to them is usually passive and part of routine use of media. More recent mass prevention campaigns tend to incorporate modern technologies such as the internet. However, the use of such technologies so far has required the recipients to actively to seek information (e.g., in the UK, looking for the NHS alcohol website) (Wakefield et al., 2010).

Many campaigns try to directly affect individuals by trying to trigger cognitive or emotional responses. Such programmes are intended to help people to adopt new healthy behaviours and/or cope with unhealthy social norms by affecting individuals' decision-making processes and removing or lowering obstacles to change and thus, help people to adopt healthy behaviours, or cope with unhealthy social norms. These changes strengthen intentions to achieve new behaviours (Fishbein & Ajzen, 2010; Wakefield et al., 2010). For instance, an anti-alcohol-misuse campaign might emphasise risks of drinking and benefits of drinking responsibly and in moderation. In the UK, 'the spot the difference' campaigns encouraged 25-44 year old people in Scotland to swap their usual drink for a lower strength one (e.g., beer at 3.8% ABV or less). This was developed by Drinkaware and the Scottish Government Alcohol

Industry Partnership (SGAIP) to encourage people to reduce their alcohol intake (Drinkaware, 2015).

In trying to change behaviours, mass media messages can also use the indirect approach. This approach tries to change the individuals' social norms by increasing the frequency and/or depth of interpersonal discussions about specific health issue. The extra exposure within the individual's social network on its own or combined with individual exposure to health messages can help reinforce or undermine changes in particular behaviours. For example, Alcohol Concern's 'Dry January' annual campaign encourages people to go alcohol-free for 31 days in January. This campaign encourages people to form support groups and invite friends or colleagues to join the group and take on the challenge too. Such message could even have an impact on someone who has not seen the campaign but decide to join the group and, thus change his or her own behaviour (Alcohol Concern, 2015; Wakefield et al., 2010).

1.5.2. Development of the concept of 'low risk' alcohol consumption

Using a similar approach to those used to address other health risk behaviours (i.e., smoking, unhealthy dietary patterns, and sedentary lifestyle; Berg et al., 2012), various governments have formulated recommendations for drinking alcohol in an effort to encourage people to reduce their alcohol intake (Rehm & Patra, 2012). Official guidelines for alcohol consumption are usually produced by government departments, public health bodies, medical associations, or NGOs such as the World Health Organization (WHO). This approach addresses three of the target areas mentioned above: provide information and education, drink-driving policy and harm reduction.

The main aims of setting specific low-risk alcohol consumption guidelines were to create a useful tool to assist consumers in making individual drinking decisions, and make it easier for governments to track how much alcohol people consume and to monitor trends over the years. Countries with strong traditions of drinking

guidelines include the USA, Canada, Australia, New Zealand, and the UK. These drinking guidelines are the core advice given to adults of drinking age on levels of alcohol consumption considered ‘safe’, ‘responsible’ or ‘low-risk' (Conibear, 2011).

The messages advise that men or women who consistently drink more than these recommended levels may increase risks to their health, and that moderate, regular consumption within the guidelines may help protect against some mortality causes such as cardiovascular disease (but such positive relationship has been criticized because any benefits might be outweigh by the increase risk of other negative outcomes (Klatsky, 2010). Data suggest that light to moderate drinking can be a part of a healthy diet and lifestyle in adults, and that it is better to have low-risk guidelines than a 'don't drink' message, which is reflected in the WHO, US, Canada and UK guidelines (Conibear, 2011).

1.5.2.1. Relative risk vs Absolute risk

Many countries have issued guidelines for moderate or low-risk drinking in an attempt to define levels of alcohol consumption at which any positive effects of low to moderate drinking are outweighed by the risks of social, economic, and physical negative consequences related to alcohol (Dawson, 2000). However, most recommendations emphasise the fact that following them will result in relative low risk for any adverse consequences attributable to alcohol consumption, but will not equal 'no risk'. Such approaches compare the Relative Risk of some health or social outcomes for different levels of consumption against the risk experienced by abstainers (Stockwell et al., 2012).

In contrast, some guidelines are predicted on concerns about the absolute risk of alcohol-related harm. One example comes from the Australian government, which based its most recent guidelines on that approach and essentially gave an estimation of what daily levels could increase to more than 1% the lifetime risk of premature death, injury or illness (Rehm et al., 2008). Detractors of that approach fear that selecting a level of absolute risk could be arbitrary and that it is likely that there will

be important variation between people and during the course of a lifetime that absolute risk does not take into consideration (Stockwell et al., 2012). However setting low-risk levels of alcohol consumption is difficult because the definitions of 'how much is too much' vary internationally and depend on the outcome of interest (Stockwell et al., 2012). Researchers and governments disagree not only about the size of a 'standard drink' and the percentage of alcohol by volume of different beverages but also about how to convert a quantity of a beverage to an equivalent quantity of alcohol. It is reflected in the fact that findings have been reported in various ways such as millilitres, grammes or fluid ounces. This discrepancy makes comparison of levels of alcohol difficult between studies (Turner, 1990) and when comparing guidelines across countries, the different sizes of standard drinks should be taken into consideration. There was a need for conversion to a standard measure of alcohol: i.e., the "standard drink" or "unit". However, the size of a standard drink varies and it contains various amounts of alcohol due to the disparities in the definition and alcohol content in a unit of alcohol, from 8g of ethanol per standard drink in the UK, 10g in Australia, 14g in the US and up to 19.75g in Japan (International Centre for Alcohol Policies, 2009).

1.5.3. 'Low-risk ' drinking guidelines

Originally, the majority of guidelines stated the limits for low-risk consumption in terms of a maximum weekly limits (Dawson, 2000). However, some guidelines added daily limits as well as or in place of weekly limits, reflecting growing awareness of the importance of drinking patterns as predictors of acute adverse consequences of drinking (Rehm et al., 1996). In the UK sensible drinking guidelines moved in 1995 from weekly recommendations of 14 units a week for women and 21 for men to daily guidelines, of 2-3 units for women and 3-4 units for men, to avoid the idea that it is acceptable to 'save up' your units for one or two big nights a week (Department of Health, 1995; NHS Choices, 2015a).

The guidelines also have varied in whether they impose different limits on consumption for males and females, with sex differences often varying for weekly

limits and daily limits, and usually including lower recommended level for women (Dawson, 2000). For example in the UK, the current advice from the Department of Health (under revision) is that, in order to minimise the risk of health harms associated with drinking: men should not regularly drink more than 4 units and women should not regularly exceed 3 units per day (Department of Health, 1995; NHS Choices, 2015a). Such differential recommendations are based on the differences in the impact of alcohol on women and men stemming from differences in body size, body composition and metabolism (Graham et al., 1998; Mumenthaler et al., 1999).

Several guidelines take into account different drinking patterns and the fact that people celebrate party, and drink more on some occasions. Some government guidelines now have an 'upper limit' which is the case in the USA where the current advice (under revision) is that women should not drink more than three drinks in any single day and men no more than four drinks in any single day. This represents a maximum intake of 42g of alcohol per day for women and 56g of alcohol per day for men (US Dietary Guidelines, 2010).

The evidence suggests a possible need for differential guidelines based on age - particularly for those under 25 years of age - but many guidelines are limited in terms of offering specific guidelines for young people (Thompson et al. 2012). For example, when young people are mentioned at all in guidelines it is typically to recommend children under 18 years old not to drink at all (e.g., Harding & Stockley, 2007). In 2009 in the UK, the Chief Medical Officer (Donaldson, 2009) took into consideration the fact the high prevalence (54%) of regular drinkers under 15 and decided to issue the following guidance for parents:

1) The healthier and best option for children is an alcohol-free childhood and that alcohol should not be consumed before the age of 15.

2) If young people aged 15 to 17 years old decide to drink alcohol it should always be in a supervised environment with the guidance of a parent or carer

but because drinking still represent a risk to health the best option for young people still remains to not drink.

3) If 15 to 17 year olds do consume alcohol they should not do so on a regular basis and certainly on no more than one day a week. Young people aged 15 to 17 years should never exceed recommended adult daily limits and on days when they drink, consumption should be below such levels (Donaldson, 2009).

Finally, some guidelines also provide special recommendations for particular at-risk populations, such as pregnant women and their unborn babies or individuals with certain medical conditions (Harding & Stockley, 2007; May & Gossage; 2001; WHO, 2006). Several also provide guidelines for people driving who might be at greater risks for themselves and others if drinking and driving a motor vehicle (WHO, 2006; Zador et al., 2000).

Overall, guidelines have to strike a balance between the many interactions between alcohol consumption and different situations. Core guidelines should incorporate limits for average volume of consumption as well as for single occasion drinking. (Rehm & Patra, 2012).

1.5.4. Labelling alcoholic drinks

Another alcohol policy measure is to require alcoholic drinks to carry labels based on the following targets: information and education, harm reduction and marketing of alcoholic drinks. Many public health organizations and policy researchers are urging for the implementation of mandated health and safety warning labels on alcoholic beverages as a method to reduce the harms associated with alcohol misuse (Scholes-Balog et al., 2012) in a similar way to food labels which contain mandatory information element (e.g., list of ingredients, nutritional content) (Stuart, 2010). The support for enhanced labelling originates from the fact that there is currently a lack of access to health and nutritional information about alcoholic beverages. Labelling can also be used as a tool to educate the consumer and

therefore try to prevent and/or modify harmful behaviours (Stockley, 2001). To address this information gap, several initiatives worldwide have called for better labelling of alcoholic drinks that would provide a message about the dangerous qualities of alcohol (Wilkinson & Room, 2009). However, a review of such alcohol policy has revealed heterogeneous recommendations, a lack of consensus on what to include, and variation in the format and wording of the labels (Martin-Moreno et al., 2013).

In 2012, the European Alcohol Policy Alliance (Eurocare) released recommendations for a comprehensive European alcohol strategy, including better labelling for alcoholic beverages providing the consumer with a list of ingredients, nutritional information (kcal), allergens and their potential effect, alcoholic strength and health warnings (Eurocare, 2012) In the USA, recommendations from the Centre for Science in the Public Interest (CSPI), called for labels giving people facts about alcohol such as a definition of moderate drinking, serving size and servings per container, calories, ingredients and alcohol content (CSPI, 2003). In Australia, the preventative health task force called for health warnings on alcoholic drinks similar to those on tobacco package (preventative health task force, 2009). In the UK, the government decided to collaborate with the alcohol industry in an attempt to provide drinkers with more information with labels including standard units, daily guidelines on alcohol intake and a health warning message (Department of Health, 2010; Martin-Moreno et al., 2013). The target was to ensure that 80% of on-shelf alcoholic drinks' labels contained this key health information by the end of the year 2013 (Portman Group, 2015). However, this target has not been met in full with only 57.1% of products meeting recommendations for best practice (Petticrew et al., 2015).

Researchers who have studied alcohol labelling policy worldwide feel that such a strategy has been an underused way to give the consumers information about alcohol and empower them to make healthy decisions about their alcohol intake (Martin-Moreno et al., 2013). One of the reasons identified is a lack of consensus

worldwide about what the labels should contain. In addition to alcohol content, the same review (Martin-Moreno et al., 2013) identified five elements as potentially useful to the consumer: (1) a list of ingredients, (2) nutritional information about the contents, (3) serving size and servings per container, (4) a definition of 'moderate intake' and (5) a health-oriented warning about the consequences of unhealthy consumption.

There is a need for more research to understand how labelling information is used and interpreted. Some existing evidence suggests labels that include a list of ingredients, nutritional information, serving size and health warnings could benefit the consumers (Martin-Moreno et al., 2013). Research suggests that alcohol warning labels may improve knowledge and attitudes regarding the harmful consequences of alcohol use among adults, but little evidence suggest that warning labels have any effect on harmful levels of alcohol consumption or specific alcohol-related risky behaviours such as drink-driving (Scholes-Balog et al., 2012; Wilkinson & Room, 2009).

Although the literature suggests that health warning labels may have some beneficial impact on knowledge and attitudes in adults (Martin-Moreno et al., 2013), there is a limited understanding of the influence of these labels among young adults. It has been found that the introduction of alcohol warning labels increased young adults' awareness and exposure to the warning labels, and increased recognition of the health risks message on the labels, but did little to change individual beliefs regarding the risks of alcohol use (Mackinnon et al., 2000; Nohre et al., 1999). Jones & Gregory (2009) found that young people, instead of using labelling to make healthy choices, could use it to buy the strongest drinks at the lowest price: they would use the information to facilitate unsafe drinking. Another study by the same authors reported that warning labels and messages would have little effect on young adults' beliefs because they did not perceive themselves to be vulnerable to the long-term consequences of alcohol use, or did not perceive these consequences to be relevant to them (Jones & Gregory, 2010).

The research mentioned above suggest that alcohol warning labels have little positive effect on drinking behaviours and associated effects in both adults and young people. Suggestions to improve the impact of labelling include more salient and varied labels that occupy a large section of the alcohol package. It might also be beneficial to tailor labels according to the characteristics and age of the consumer (Scholes-Balog et al., 2012). Furthermore, in order to be more effective, labelling should be used as one aspect of a large range of other strategies and combined with a comprehensive alcohol strategy targeting attitudes, knowledge and behaviour related to harmful alcohol intake (Martin-Moreno et al., 2013).

1.5.5. Alcohol Tax Policy and Minimum Price per Unit

The measure of increasing alcohol price is an example of governments' attempt to address the following targets: availability of alcohol, pricing policies and harm reduction. Based on fundamental economic laws, increasing the price of alcohol (i.e., through tax increases) is expected to lower alcohol consumption and its adverse consequences (Elder et al., 2010). There is evidence that raising the cost of alcohol has a significant impact and leads to concomitant reductions in alcohol consumption. For example, a comprehensive meta-analysis of studies on pricing and alcohol consumption reported a significant effect of alcohol pricing on alcohol consumption (Wagenaar et al., 2009). Alcohol pricing was inversely related to alcohol-related morbidity and mortality from chronic illness associated with excessive alcohol consumption, violence, traffic crash fatalities and drunk driving, rates of STDs and risky sexual behaviour, other drug use, and crime (Anderson et al., 2009; Chaloupka et al., 2002; Lonsdale et al., 2012; Wagenaar et al., 2009).

However, one of the disadvantages of using governmental taxation and duty to increase the price of alcohol is that taxation applies uniformly to all alcoholic drinks, which still gives retailers the possibility to sell discounted beverages and offer multi-buy promotions (e.g. 'happy hours') in retail outlets. It means that, to a certain extent, the retail sector can still produce relatively low-cost alcohol. This is why introducing a pricing policy based on the alcohol content or strength of alcoholic beverages, such

as a minimum price per unit of alcohol (MPU) policy has been seen by some as a possible more effective alternative (Donaldson & Rutter, 2011; Lonsdale et al., 2012).

The UK and Scottish governments were among the first to propose the universal introduction of a minimum pricing policy (which is based on the evidence that there is a relationship between alcohol price, consumption, and harm), and to consider raising the price of alcohol as a possible effective legislative solution. (Lonsdale et al., 2012). The increased availability and affordability of alcohol have been identified as key components for an effective strategy to curb people's consumption and address alcohol-attributable harms in the UK (ONS, 2008). An economic model developed at the University of Sheffield in the UK has predicted that the introduction of a minimum price per 10ml 'unit' of alcohol would lead to significant reductions in alcohol consumption (Meng et al., 2012). Another report from the University of Sheffield indicated that a 50p minimum price would help generate savings £793.7 million in terms of the overall costs associated with treating and managing excess alcohol consumption (Brennan et al., 2008; Lonsdale et al., 2012).

MPU policy would require holders of liquor licences to charge a minimum price per unit of alcohol (calculated as: minimum price per unit × strength of the alcohol × volume in litres) so that the more pure alcohol content in a product, the higher the price (Katikireddi & Mclean, 2012). Such a minimum pricing would: create a 'minimum price' beneath which alcohol could not be sold; prevent retailers from using cut price alcohol to attract consumers; and relate price to alcohol content - effectively decreasing the affordability of alcohol beverages (Eurocare, 2015).

In May 2012, the Scottish Parliament passed legislation to introduce a minimum retail price for alcohol that should have come into force in 2013 (Alcohol (Minimum Pricing) (Scotland) Act, 2012). However, it raised important legal considerations for the UK as a member state of the European Union (EU) (Katikireddi & Mclean, 2012). The European Commission (EC) objected to the introduction of MPU based on the argument that such a policy would be a trade

restrictive measure. The EC suggested that taxation should be favoured instead of MPU and that alcohol tax increases can achieve the same impact as MPU in reducing alcohol-related harm (Eurocare, 2015).[1]

We have seen how different measure have been implemented in an attempt to reduce people alcohol intake and alcohol related negative consequences, but how effective such alcohol policy strategies are in reality. A systematic review and meta-analysis of the effectiveness of alcohol policy (Anderson et al., 2009) show that policies regulating price and availability of alcohol, and enforced legislative measures tackling drink-driving are effective interventions in reducing alcohol-related harm. Increasing alcohol price, reducing availability and banning advertising were also shown to be effective interventions. Despite its apparent effectiveness, taxation as a method of reducing harm from drinking appears to have been under-used and the real price of alcoholic beverages has decreased in many countries, partly because governments have not increased tax levels in accordance with inflation and rising incomes (Babor et al., 2010).

1.6. Models of health behaviour

The discipline of health psychology is interrelated with the field of public health. Behaviour-change theories have been increasingly used in developing international health programs to prevent millions of people worldwide from dying or suffering from preventable health problems. The genesis of many of these problems is not purely biological or medical, but stems from behavioural factors too, which makes the application of health psychology relevant. Better understanding of human behaviour change holds the key to improving indices of global health, and preventing chronic and infectious diseases (Elder, 2001). Alcohol policy makers' measures and prevention programs are based on decision-making and health behaviour change models in order to provide tailored messages and a supportive environment that encourages individuals and communities to make positive health

1 The legal process concerning the introduction of MPU in Scotland are still ongoing. A provisional timetable indicates the Inner House of the Scottish Court of Session could rule to implement MUP by the 8th June 2016 (see: http://www.alcoholpolicy.net/2016/04/price-taxation-new-analysis-published-scottish-mup-decision.html)

behaviour changes.

1.6.1. The Information-Motivation-Behavioural Skills (IMB) model

The Information-Motivation-Behavioral Skills model (IMB; Fisher & Fisher, 1992, 1993) is an empirically validated model initially developed to explain HIV-related behaviours but that is now used to understand other complex health behaviours (Nostlinger et al., 2011). This conceptual framework suggests that three social-cognitive variables - information, motivation and behavioural skills - are key variables in predicting and understanding why people initiate and maintain health-related behaviours (Nostlinger et al., 2011).

According to the IMB model, information is 'an initial prerequisite for enacting a health behaviour' (Misovich et al., 2003). People needs to be provided with easily understandable and relevant information about the outcome behaviour (i.e., health promotion facts and experience-based techniques that people can apply in everyday situations) (Fisher et al., 2003). Possessing information is necessary, but it may not be enough to cause behaviour change and people need to be motivated to engage in the behaviour. Motivation includes personal motivation (e.g., positive personal attitudes and intentions towards the health behaviour) and social motivation (e.g., social support for enactment of the health behaviour). In addition to having relevant information and being motivated to change, individuals need to possess the adequate skills to do so. In the IMB model, behaviour skills are defined as the ability to effectively execute the health behaviour by developing appropriate skills such as self-monitoring and goal-setting (Fisher et al., 2003). Behavioural skills mediate the association between information and motivation and the outcome behaviour (Kelly et al., 2012). Substantially, someone who is well-informed and motivated is more likely to develop and enact the related behavioural skills and more inclined to engage in the targeted health behaviour (Nöstlinger et al., 2011). The IMB model has been extensively applied to predict positive health behaviour has been found to be transferable to different health behaviours and effective in promoting behavioural changes among people (Bian et al., 2015). This model has effectively explained and

promoted medication adherence to antiretroviral therapy (Starace, Massa et al., 2006) and self-care behaviours such as diabetes care (Mayberry & Osborn, 2014). Its validity has been proved in developing interventions focusing on sexual risk reduction (e.g., condom use; Chang et al., 2014) cancer screening (e.g., breast self-examination; Misovich et al., 2006), and smoking and tobacco use (Zhu et al., 2013) among others. However, to our knowledge, the use of the IMB model in relation with alcohol misuse has been limited (but see de Visser, 2015). Alcohol use behaviour has rarely been explored on its own but mainly as a detrimental factor in initiating and maintaining health behaviour in particular in relation to sexual health where the co-occurrence of alcohol consumption and the adoption of risky sexual behaviours has often been an important topic (Maisto et al., 2004).

Existing literature about the efficacy of the 'sensible drinking' message and adherence to drinking guidelines shows that it is extremely important that people understand the prevention message, feel motivated to engage in drinking sensibly and possess the social-cognitive skills to do so (de Visser, 2015; Gill & O'May, 2007a). However, it has been found that young adults often lack accurate knowledge about the drinking guidelines (de Visser, 2015; Gill & O'May 2007a), do not find the unit-based guidelines useful nor are motivated to adhere to them (de Visser & Birch, 2012; White et al., 2005) and also lack the adequate skills to use them to monitor their own drinking (de Visser, 2015; de Visser & Birch, 2012; Gill & O'May, 2007b).

In order to create effective alcohol reduction strategies, it is essential to put the primary focus on young people's knowledge and perceptions of the unit-based guidelines, their motivation and capacity to adhere to them. The IMB model has been under-used in the field of alcohol misuse and was chosen as a theoretical framework, firstly because of the high applicability and effectiveness of interventions for promoting health behavioural change based on the IMB model (Chang et al., 2015) and secondly, its reliability in predicting health behaviour performance (Misovitch et al., 2003).

1.7. Interpretative Phenomenological Analysis

The Interpretative Phenomenological Analysis (IPA; Smith, 1996), is an experiential qualitative research methodology focusing on people's experiences and the meaning they attach to them. This methodology puts exploring and understanding the experience of a particular phenomenon at its centre (Smith, 1996). The analysis of what participants say is carried out in order to learn about the participant's cognitive and affective reaction to what is happening to them. IPA has theoretical roots in phenomenology, hermeneutics and idiography (Smith, 2011). Phenomenology is the philosophical movement concerned with lived experience. IPA is phenomenological in that at its core is the detailed examination of the person's personal and social world. It explores the human lived experience and the individuals' personal perception as they appear, without referring to prior theoretical assumptions (Smith, 2011; Smith & Osborn, 2007). IPA argues that "human beings are not passive perceivers of an objective reality, but they come to interpret and understand their world by formulating their own biographical stories into a form that makes sense to them" (Brocki & Wearden, 2006, p.88).

At the same time, the research exercise in IPA is a dynamic process where the researcher plays an active role. In using an interpretative process, the researcher tries to access and make sense of the participant's personal world. However, experience is not easily accessible from the heads of participants. The whole process of analysis requires engagement and interpretation on the part of the researcher, which ties IPA to a hermeneutic perspective (Smith, 2011). Part of the complexity of the IPA approach stems from the fact that access to experience comes from a participant who is also trying to make sense of what is happening to them. For this reason, Smith (2011) described the process of IPA as engaging in a double hermeneutic, whereby the participants are trying to make sense of their world while the researcher is trying to make sense of the participants trying to make sense of their world (Brocki & Wearden, 2006; Smith, 2011; Smith & Osborn, 2007). IPA assumes a chain of complex connections between people's talk and their thinking, and emotional state

where the researcher plays a central role in interpreting people's mental and emotional state from what they disclose and express (Smith, 2011).

IPA is idiographic in its commitment to analyse each case in detail. Sometimes this commitment is made manifest in the use of single case-studies which represent in-depth examinations of the lived experience of a single person (e.g., de Visser & Smith, 2006). More commonly IPA involves the detailed analytic treatment of each case followed by the search for patterns across the cases within small homogeneous samples; not only presenting shared themes but also highlighting the particular way in which these themes play out for individuals (Smith, 2011).

1.7.1 Rationale for using IPA

IPA is one of the best known and most commonly used qualitative methodologies in psychology and has a particular relevance in the field of health psychology. IPA allows researchers to explore people's perceptions of and interpretation of their bodily experiences, and the meanings which they assign to them (Brocki & Wearden, 2006; Smith, 1996). This qualitative analytic approach has been used across a broad range of research interests including, pain (Smith & Osborn, 2007), chronic fatigue syndrome (Arroll & Senior, 2008), cancer (Reynolds & Lim, 2007), and alcohol use (de Visser & Smith, 2007)

IPA provides an interesting framework for understanding what role the unit-based drinking guidelines and the 'low-risk' drinking message play in young people's experience as drinkers, and how they balance enhancement motives (e.g., having fun and getting drunk), and perceived positive outcomes of consuming alcohol with a health behaviour change intervention that primarily focuses on negative health-related consequences of excessive drinking. IPA also provides an insight into the sense-making processes involved in understanding these experiences. Gaining a better understanding of how the government's drinking guidelines are used and what other strategies young adults develop to monitor own alcohol consumption within different social contexts, might suggest more effective ways to reduce their alcohol

intake and encourage them to drink within the recommended guidelines.

Another rationale for using IPA is the desire from the author to use semi-structured interviews, which Smith & Osborn (2003) describe as the exemplary method for IPA. It was also felt that the provision of clear and straightforward guidelines for the analyses made the IPA approach very accessible. However, although there is a basic process to IPA, such guidelines are intended for adaptation and development: the method does not seek to claim objectivity through the use of a detailed, prescriptive methodology. The author enjoyed the certain level of creativity available on how to proceed with the data analysis As a qualitative research method, IPA is inevitably subjective. Although this fact is recognised and welcomed by advocates, others may raise questions of validity and reliability (Golsworthy & Coyle, 2001).

IPA was chosen as a mean of analyses for one of the studies because of its potential for providing interesting and useful insights into the subjective perceptual processes involved and the experiences of participants. The richness of participants' accounts enabled the author to explore in-depth the reasons behind people's thoughts, beliefs and behaviours regarding the UK government's drinking guidelines and the 'low-risk' drinking message in relation to their own drinking behaviours. IPA was a relevant and appropriate analytic perspective for the qualitative component of this dissertation.

1.8. Research overview

This thesis reports the finding of three studies design to investigate and compare different definitions of standard drinks and alcohol intake recommendations worldwide and explore university students' perception and knowledge of the unit-based guidelines. How motivated they are to use them and their ability to adhere to these guidelines but also their ability to accurately estimate recent unit alcohol intake.

Study 1 reviewed official definitions of standard drinks and governmental

guidelines of 57 countries. This review of national guidelines included: definitions of standard drinks; guidelines for alcohol intake; legal levels of alcohol consumption for drivers of motor vehicles; and safe levels of alcohol consumption for pregnant women. Official guidelines published on governments websites were preferred to non-governmental ones. The levels of alcohol consumption for drivers were found in the WHO Global Status Report on Road Safety. To facilitate comparison, only guidelines specified in, or convertible into, grams of ethanol were included. Descriptive statistics were used for the analyses. Correlations and ratios were run to look at the association between daily and weekly guidelines maxima and ratio relationships to look at the variance between the two. One-way ANOVA was used to compare variations in variation between levels of Blood Alcohol Concentration (BAC) limits when driving.

Study 2 included the first quantitative phase of a mixed-methods design and aimed at identifying determinants of motivation to adhere to the drinking guidelines and predictors of the ability to accurately estimate alcohol intake in terms of units. An online survey was used to examine the multivariate correlates of motivation to use guidelines and accuracy of estimates of alcohol consumption among 614 students (415 women and 199 men aged 18-30). Correlates of alcohol consumption such as self-efficacy and social drinking motives have been identified among students (Atwell et al., 2011). Study 2 had an additional focus on beliefs about, and use of government guidelines and a particular focus on correlates of motivation to use the guidelines and actual ability to use them. The survey used an open question to assess participants' ability to give an accurate estimation of the unit content of what they drink. They had to describe in detail what they had consumed on their most recent drinking occasion. Based on their own recollection, they were then asked to assess the alcohol unit content consumed on that occasion. They were allocated to three groups – under-estimators, accurate and over-estimators - depending on how accurate they were. Motivation to adhere to the guidelines was assessed with one item. Two psychological traits (conscientiousness and extraversion) were assessed with 10 items each adapted from Goldberg (1992). Alcohol Outcome Expectancies

(AOE) were assessed with 27 items in two sub-scales (Leigh & Stacy, 1993). Participants' knowledge of the government guidelines was assessed with two items and familiarity with the guidelines with one item, and perceived use of guidelines with one item, all adapted from de Visser & Birch (2012). Frequency of counting units while drinking was assessed with one item. Participants' alcohol consumption within the last week was assessed asking how many units of alcohol they had on each day of the last seven days. This task was completed with the aid of a guide to the unit content of various drinks (pictures and description of unit contents of each drink). This task was presented after the assessment of participants' knowledge of the government guidelines. Questionnaire set up did not allow backtracking, so it was impossible for participants to return to earlier pages to correct incorrect responses to knowledge questions. Reports of unit consumed on each day in the last week were computed in a new variable which summed the total unit intake for that week. Frequency of getting drunk in the last month was also assessed using a single item adapted from de Visser & Birch (2012) (See Appendix D for full survey). Descriptive statistics (i.e., mean scores were used to identify level of motivation and familiarity, and frequency of use of the guidelines. One-way ANOVA was run to identify correlates of giving accurate alcohol consumption rather than under- or overestimates and Scheffé post hoc comparisons conducted to point out significant differences between the three groups. Multinomial logistic regression was used to identify the variance in group membership (accurate, under- or over-estimator) and significant independent multivariate correlates of giving an accurate estimate. Correlates of motivation to adhere to unit-based guidelines were displayed in a correlation matrix. Finally, based on the significant bivariate correlates identified, multivariate linear regression (forward selection and backward deletion) was run and produced significant multivariate correlates of motivation to use the guidelines.

Study 3 focused on the second phase, the qualitative component of the mixed-methods design. Sample selection and an interview guide were developed based on the results of the initial quantitative phase. In study 2, determinants of motivation and accuracy, lack of knowledge and low frequency of use of the guidelines were

identified and shaped the topic interview guide. The sample selection reflected a similar ratio of men and women than in study 2 and 12 semi-structured interviews of, on average 45 minutes long, were conducted with 8 women and 4 men aged 19 to 28. Before the start of each interview, written consent was gained and a retribution of £5 was given to participants. The qualitative research interview started with a brief description of the topic investigated. Every interview started with the following question: “To start off, could you please tell me a little bit about you: how often do you drink?”. This was followed with questions about the participants' alcohol use (i.e., “what do you usually drink ?”). The other questions were grouped under different topics. Positive and negative alcohol expectancies (i.e., “what are the good things about drinking?”), alcohol-related negative health consequences (i.e., What affect do you think drinking has on your health?”), Factors that influenced alcohol consumption on most recent drinking occasion (i.e., “at what point did you decide to stop, and why?”) which was then linked to questions about ability to assess alcohol unit content of most recent drinking day (i.e., “how many units do you think you had?”) and also by asking participants to do a task. They were presented with pictures of alcohol beverages with different alcohol strength and in different glass and containers size, and asked them how many units each contained. Some questions were also focusing on people's knowledge (“can you describe the government's guidelines for units of alcohol?”) and attitude toward the unit-based guidelines (i.e., “how useful do you think unit-based guidelines are?”). Motivation was assessed with one question (“how motivated are you to adhere to these guidelines?”) and familiarity too (“how familiar do you feel with these guidelines?”). The interviews usually ended with questions about interviewees' perception of the guidelines, past prevention campaigns, and how to shape future public health measures in a more effective way (i.e., “can you think of a better way to help people monitor their alcohol use?”). For full interview topic guide, see Appendix B.

Thematic analysis modelled on the procedure used in IPA (Smith et al., 2009) was used. The initial step was to read the first interview and write in the left margin of the transcript any observations, reflections and thoughts. The initial interview was

re-read several times, and emergent themes were identified in the right margin. These themes were organised in “clusters” in a table with quotations from the interview. A table of themes including quotations from the participants was created for each interview. The same process was applied for the 11 remaining interviews. New emergent themes were added to those identified in earlier data. Lastly, a summary table including themes and quotations from all interviews was created to give a general overview (See appendix C). Finally, the IMB model was used as theoretical framework to frame the results from the interpretative analyses.

1.9. Research questions

The research presented in this dissertation aimed to explore an alcohol control policy that has been used around the world. The 'sensible' drinking message and the development of the concept of 'standard drink' or 'unit' of alcohol is a health behaviour change measure that has been implemented based on the idea that providing consumers with facts about alcohol-related negative consequences and maximum alcohol unit intake recommendations would enable them to make 'sensible' decisions about their own drinking, but is it really the case? The following research questions focus on young adults' perceptions and use of the units of alcohol system and the 'sensible' drinking message:

1. What is the 'sensible drinking' message and how can it be defined?
2. Do young adults understand the unit-based guidelines and use them to monitor own drinking?
3. What are the key determinants of motivation to adhere to unit-based guidelines in students?
4. What are the key determinants of being able to accurately estimate recent unit intake in students?
5. Can the IMB Model be used as an effective theoretical framework to predict behaviour change for alcohol use?

Chapter 2

Study design and methodological overview

2.1. Methodological issues

Given the variety of the research questions presented at the end of Chapter One, varied research methods of data collection using both quantitative (survey, review) and qualitative (interviews) were used in this programme of research. In this chapter the methodological challenges faced by mixed methods research, the key decisions and principles involved in a mixed-methods design, the explanatory sequential design, and the limitations and rationale for using an explanatory sequential design are discussed.

2.1.1. Ontology and epistemology assumptions underlying mixed-methods research

Research designs are procedures for collecting, analysing, interpreting, and reporting data (Teddlie & Tashakkori, 2009). Investing a specific topic can be based on different approach traditionally quantitative (i.e., measure and statistical analysis of variables) or qualitative (e.g., observations, individual interviews). However, quantitative and qualitative components can also be used together in a single study or series of related studies and mixed-methods designs and have progressively been viewed by some as a useful alternative to exclusive quantitative or qualitative perspectives. Mixed-methods research can be defined as the integration of both quantitative and qualitative approaches to investigate a topic within the same research project (Ostlund et al., 2011) but the validity of combining qualitative and quantitative approaches is an ongoing debate (Yardley & Bishop, 2015). Detractors of this approach argue that the two paradigms are incompatible because of the fundamentally different ontological assumptions and epistemological origins of these two methods (Dures et al., 2011). Quantitative methods stem from a realist (or post-positivist) perspective, which emphasises research using precise and objective measurements as a way to predict and then control a 'real' world without human and

error-prone perceptions of it. From this perspective, reality is universal, objective and quantifiable. On the other hand, qualitative methods are rooted in a more interpretative (or constructivist) perspective, that see research as a way to produce a rich and multifaceted knowledge of worlds where reality is socially constructed by and between the persons who experience it (Dures et al., 2011; Yardley & Bishop, 2015).

Mixed-methods research often favours an epistemological middle ground where such a dichotomy is less relevant and mixing methods is possible. For the advocates of this approach, there are multiple ways of making sense of a topic and mixed methods research is 'a powerful third paradigm choice that often will provide the most informative, complete, balanced, and useful research results' (Johnson et al., 2007, p. 129). Pragmatism is a fundamental philosophical approach for mixed methods that suggests that quantitative and qualitative methods should be combined in ways that exploit their strengths and acknowledge their limitations as both can be viewed as means of knowledge production (Greene & Caracelli, 1997; Yardley & Bishop, 2015). Shared qualitative and quantitative aims are to identify, to look at relationships and links between the phenomena under investigation and acknowledge the existence and importance of the physical, natural world as well as the importance of reality and influence of human experience (Johnson & Onquegbuzie, 2004).

Characteristics of mixed-methods designs include: using quantitative and qualitative perspectives within the same research project; a research design specifying the sequencing and priority given to the quantitative and qualitative elements of data collection and analysis; a clear explanation of how the quantitative and the qualitative aspects of the research relate to each other; and pragmatism as the philosophical underpinning for the research (Denscombe, 2008).

2.1.2. Design principles and key decisions

1. It is essential for a researcher to think about and decide which design to use and which one is best to address the research's purpose and question. The decision to use a mixed methods design can be fixed, emergent or a combination of both (Teddlie & Tashakkori, 2009). A fixed mixed-method design is when using quantitative and qualitative methods is decided and planned at the beginning of the research process, whereas in an emergent mixed methods design such decision can occur at different time during the research process. However, the dichotomy is not clear and mixed methods designs can be both fixed and emergent (Teddlie & Tashakkori, 2009). Furthermore, different typologies of mixed method designs exist so it is important to take some key decisions in order to select a design that reflects interaction, priority, timing and mixing of the different quantitative and qualitative components or (strands) of the research and how they interact with each other (Teddlie & Tashakkori, 2009).

2. Level of interaction between the quantitative and qualitative components
   The level of interaction is the extent to which the quantitative and qualitative components are kept independent or inform each other (Teddlie & Tashakkori, 2009). When the level of interaction is independent the quantitative and qualitative research questions, data analysis and collection are kept separate and the two strands only come together at the stage of the overall interpretation of the research and when conclusions are drawn. When the level is interactive, the two strands are mixed before the interpretation and can take place at different point of the research (Borglin, 2015; Teddlie & Tashakkori, 2009).

3. Determine the relative priority of the quantitative and qualitative strands
   Priority refers to the decision of the relative importance of the quantitative and qualitative elements within the study. (Teddlie & Tashakkori, 2009). The

level of priority of the strands is dependent on the research questions (Borglin, 2015). The three following options exist: equal priority (the qualitative and qualitative strands play an equal role in addressing the research question, quantitative priority or qualitative priority where one of the method plays a more important role within the study than the other. That decision relies a lot on the paradigm and theoretical drive chosen by the researcher to guide a study. Usually a post-positivist paradigm leads to a quantitative priority, a constructivist paradigm to a qualitative priority, and a pragmatic tradition to equal priority of the qualitative and quantitative strands. (Creswell. 2011).

4. Decide timing of occurrence of the two strands

   Timing (or pacing and implementation) refers to the temporal relationship between the quantitative and qualitative components of the study and relate to both the time the data sets are collected but also the order in which the results from the two sets of data are used (Green et al., 1989; Teddlie & Tashakkori, 2009). Timing can be concurrent (i.e., both strands are implemented during a single phase of the study), sequential (i.e., methods are implemented during distinct phases where the data collection and analysis for one method occurs before data collection and analysis for the other method starts), or multi-phases where both methods are used in several phases of the research concurrently an/or separately (Borglin, 2015).

5. Choose procedure for mixing quantitative and qualitative strands

   The fourth stage of mixing the two strands is also known as the point of interface or stage of integration (Morse & Niehaus, 2009). Kroll & Neri (2009) argued that a truly mixed-methods design involves the integration of the qualitative and quantitative findings at some stage of the research process, during the data collection, during the data analysis, at the interpretative stage of the research or within a theoretical framework. Mixing during interpretation means that the quantitative and qualitative strands are only

mixed after a separate data collection and analysis. Mixing during data collection implies that the results of the first method uses will shape the design of the data collection for the second component. Mixing during data analysis can be defined as when each strand is analysed separately but then are merged together into a combined analysis. Finally, it is also possible to mix within a programme objective framework where mixing the two strands occur in the development phase (i.e., using a theoretical framework to guide the design within which quantitative and qualitative methods are mixed) (Borglin, 2015; Teddlie & Tashakkori, 2009).

For the purpose of the present research programme, choosing a mixed-method design was a combination of fixed and emergent designs. Due to the nature of the subject studied, it was decided from the start that combining quantitative and qualitative strands would be the best way to have a multifaceted understanding of the topic. However, the final design of the qualitative component was based on the results of the quantitative phase. The timing of occurrence of the quantitative and qualitative strands that was adopted was sequential with the quantitative phase occurring first and the qualitative second which was important because of the need to recruit interviewees for study 3 from the survey sample in study 2 in order to focus on the same group of students in both studies. The option used for priority was to give the two strands equal priority so both would be playing an important role in answering the research questions. An interactive level of interaction was favoured and the mixing of the quantitative and qualitative methods took place during the data collection which meant that the results from the initial quantitative phase shaped the data collection of the second, qualitative phase with purposive sampling from the survey study for the interviews in study 3.

2.1.3. The explanatory sequential design

An important characteristic of a mixed-methods design is paradigm pluralism, which is the belief that different paradigms can be perceived as underlying philosophy for the use of mixed methods (Teddlie & Tashakkori, 2012). The main

philosophical assumption behind the explanatory design is that there is a shift from a post-positivist perspective for the researcher during the quantitative phase to a more constructivist orientation for the qualitative phase (Teddlie & Tashakkori, 2009).

Based on the key decision taken at during the first stage of the research, the mixed-methods design adopted for the purpose of this research programme was the explanatory sequential design or the explanatory design (Teddlie & Tashakkori, 2012). The design selected use two distinct but interactive phases: first, the collection and analysis of quantitative data followed by the collection and analysis of qualitative data. The qualitative phase is used to explain the initial results from the quantitative data more in-depth (Creswell & Plano Clark, 2007). For example, in this research programme, one of the aim of the quantitative phase was to use a survey to identified predictors of motivation to adhere to the unit-based guidelines and of greater capacity to monitor alcohol unit consumption. Based of the results from the quantitative phase, the subsequent qualitative stage used individual semi-structured interviews to further explore the knowledge of, attitudes toward, and use of unit-based guidelines among the same sample of university students. This design has also been called a qualitative follow-up approach (Morgan, 1998).

2.1.4. Limitations and rationale for using the explanatory design

Some limitations of using a mixed-methods design include the fact that implementing two strands can be a complex and lengthy process and that sometimes it can be complicated to decide which quantitative results need to be further explained during the qualitative stage, or how to decide what criteria should be used for participant selection for the qualitative phase.

Despite these barriers, mixed method research that uses both quantitative and qualitative approaches in combination may provide a better understanding of research problems and complex phenomena than either approach alone (Creswell & Plano Clark, 2007). One other rationale for combining quantitative and qualitative strands is complementarity which can increase a study's validity and interpretability

by effectively managing overlapping, but different aspects of a phenomenon. Completeness is the notion that using both methods can bring a more comprehensive account and understanding of the topic studied. The concept of illustration refers to another benefit of mixing methods, where qualitative data are used to 'put meat on the bones' of 'dry' quantitative data (Molina-Azorin & Cameron, 2010; Bryman, 2006; Teddlie & Tashakkori, 2009). Both approaches were adopted in this mixed methods research programme in order to benefit from the advantages of completeness and complementarity of study 2 and study 3. It was felt that adopting such a design would be the best way to, first, identify the determinants of motivation to adhere to the guidelines and predictors of accuracy of estimating unit intake using a survey, and second, to further explore such determinants as part of the participants' own personal experience as drinkers in a second qualitative phase using individual interviews.

2.2. Quantitative Methods: the online survey

For the quantitative phase of this mixed-method research (study 2) the use of an online survey was chosen in order to carry out a large scale data collection. Web surveys have become increasingly popular method of data collection in quantitative research. In comparison to other means of data collection web surveys are relatively quick and easy to carry out and more cost-efficient method than certain more traditional methods (Couper, 2000, McCabe et al., 2006). Furthermore, online surveys are a good mode of data collection to use for a population of university students because of the near universal use of the Internet among them (Couper, 2000). One study showed that the report of online computer use within the 18-24 years old age group, which constituted the majority of the sample used in study 2, was extremely high (Rainie, 2001).

Study 2 was granted ethical approval by the University of Sussex (see appendix A). Recruitment was done using an online participant pool and advertisements on campus. The sample consisted of 614 university students (415 women and 199 men aged 18-30). The upper age limit was set to 30 years old in other to keep the focus on

young adults. Individuals interested in taking part were directed to an online information sheet and consent form. Once informed consent was obtained, participants were given access to an online questionnaire. All responses were anonymous and participants received research participation credits or were entered into a ballot for a £25 spending voucher. Descriptives analyses were used to assess knowledge and attitudes toward the drinking guidelines and male-female comparisons. Bivariate analyses were conducted with two key foci: motivation and actual use related to guidelines. Multivariate analysis was used to identify correlates of motivation to use the guidelines and ability to do so.

2.3. Qualitative research option: semi-structured interviews

The second phase of the mixed-methods design was based on the aim of qualitative research to 'make sense of, or interpret, phenomena in terms of the meanings people bring to them' (Denzin & Lincoln 2005, p. 3) and understand how people make sense of their world from their own perspective. It was decided to use qualitative research interviews in study 3 because they encourage in-depth discussion about events, situations, and information relevant to participants and the study (Denzin & Lincoln, 2005).

The interviewees were selected from among the people who had completed the online questionnaire described above and an invitation to take part in the second phase was sent by e-mail to those who expressed an interest in taking part in the qualitative phase and 12 semi-structured were conducted. How many interviews should be included in a qualitative study is not always straightforward. In the present situation, the number of interviews conducted was mainly influenced by outside determinants. First, there was some time restrictions for the data collection for study 3 and secondly the answer rates to the e-mail invitation were low. However, it was important to keep the same proportions of men and women than in the survey study and twice as many women were selected than men.

It was decided to use semi-structured interviews instead of structured interviews

to give the participants more freedom and space to talk about their experience as drinkers. The 12 interviews were conducted in a quiet private space on campus and lasted on average 45 minutes each . An interview guide was developed shaped by the results from the quantitative phase. Study 2 identified that knowledge of drinking guidelines and motivation to adhere to them were low and that half of the sample lack the ability to accurately estimate unit alcohol content of what they drink. Participants stated that they did not used the unit-based guidelines to monitor own drinking and did not find them useful. The interview topic guide focused on better understanding the reasons behind such results from study 2. Recordings of interviews were transcribed verbatim, and all identifiers were replaced with pseudonyms.

2.3.1. Interpretative thematic analysis

Thematic analysis (TA) is a qualitative analytic method that is independent of theory and epistemology and is considered as a flexible research tool with the potential to provide a rich, detailed, and complex account of data (Braun & Clarke, 2006). TA involves the searching across a data set (i.e., interviews, focus groups) to find, analyse and report repeated patterns of meaning (themes) (Braun & Clarke, 2006). The exact form of TA varies but for the purpose of the analyses carried in study 2, an essentialist or realist perspective which put the emphasis on experiences, meanings and the reality of participants (Braun & Clarke, 2006). Key themes were identified using an inductive approach of coding. It is a coding process that do not rely on a coding frame but still identify important themes in relation to the research question. It is a form of TA that is data-driven (Braun & Clarke, 2006).

The flexibility of TA is one of its key advantages but there is also a lack of clear guidelines on how to carry a TA. On the other hand Interpretative Phenomenological Analysis (IPA: Smith et al., 2009) are carried within specific guidelines. This approach is about understanding people's everyday experience of reality which was also the main focus of study 2. It was decided to carry out an interpretative thematic approach modelled on the procedures used in IPA.

Chapter 3

Lack of international consensus in low risk drinking guidelines

3.1. Abstract

Introduction and Aims: To encourage moderate alcohol consumption, many governments have developed guidelines for alcohol intake, guidelines for alcohol consumption during pregnancy, and legislation relating to blood alcohol limits when driving. The aim of this study was to determine the degree of international consensus within such guidelines. **Design and Methods:** Official definitions of standard and consumption guidelines were searched for on government websites, including all 27 European Union Member States and countries from all global geographic regions. **Results:** There was a remarkable lack of agreement about what constitutes harmful or excessive alcohol consumption on a daily basis, a weekly basis, and when driving, with no consensus about the ratios of consumption guidelines for men and women. **Discussion and Conclusions:** International consensus in low risk drinking guidelines is an important - and achievable - goal. Such agreement would facilitate consistent labelling of packaged products and could help to promote moderate alcohol consumption. However, there are some paradoxes related to alcohol content labelling and people's use of such information: although clearer information could increase people's capacity to monitor and regulate their alcohol consumption, not all drinkers are motivated to drink moderately or sensibly, and drinkers who intend to get drunk may use alcohol content labelling to select more alcoholic products.

3.2. Introduction

There is considerable evidence that excessive use of alcohol is associated with various negative consequences for individuals' physical and psychological wellbeing, and for the harmonious functioning of the societies in which they live.[1-5] For many outcomes, there are linear associations between increasing alcohol consumption and harms to health.[6,7] For other health outcomes there appear to be non-linear threshold associations: only alcohol consumption beyond a certain levels is linked to poorer outcomes.[6,8] For yet other health outcomes, there are curvilinear associations, with moderate alcohol consumption appearing to offer health benefits.[9-13] Despite these different patterns of association, it is apparent that if people are to drink alcohol, then it would be sensible for them to do so in moderation.

But what is "drinking in moderation", "sensible drinking" or "low risk drinking"? The existence and use of these different terms reflects different conceptualisations of risk and suggests that giving clear definitions and instructions for moderate alcohol consumption may not be straightforward.[14] In this manuscript, the term "low risk drinking guidelines" will be preferred. Low risk drinking guidelines must account for the availability of a range of drinks which vary in alcohol concentration. Such recommendations must also account for differing health and social risks that arise in particular drinking episodes and those risks that accumulate over time.[15,16] Consideration must also be given to differences in the impact of alcohol on women and men arising from differences in body size, body composition, and metabolism.[17,18] Specific guidelines may also be required for particular segments of the population known to be at greater risk of harm to themselves and/or others, such as people driving motor vehicles,[19-21] and pregnant women and their unborn babies.[21-23]

Many governments and government agencies have developed low risk drinking guidelines . These commonly include recommended daily and/or weekly maximum intake expressed as numbers of "standard drinks" or "units of alcohol".[11,24,25]

However, there is evidence of wide variation in how different countries define standard drinks.[14,15,26] This lack of consensus has implications for research: it can make it difficult to make direct comparisons between epidemiological studies conducted in different countries. A lack of consensus may also limit the capacity for individuals living in a globalised world to develop and use transferable knowledge and skills for monitoring and regulating their alcohol consumption. The development of a Draft Global Strategy to reduce alcohol-related harm is part of this process.[27] Although the WHO Regional Office for Europe recommends that women and men drink no more than 2 standard drinks (20g ethanol) per day,[28] there is little evidence of substantial progress toward consensus in the published low risk drinking guidelines.[29]

The aim of this paper was to examine current low risk drinking guidelines in different countries to determine the degree of consensus in relation to: (a) definitions of standard drinks; (b) guidelines for alcohol intake; (c) legal levels of alcohol consumption for drivers of motor vehicles; and (d) safe levels of alcohol consumption for pregnant women. Such agreement and consistency are important for governments, researchers, and drinkers.

3.3. Methods

Official definitions of standard drinks and intake guidelines were searched for on government websites. A list of the 57 included countries is included at Appendix 1. We included all 27 member States of the European Union and 5 additional European countries, and 5 countries each from Africa, the Americas, Asia, the Middle-East and Oceania. To allow direct comparisons, guidelines and recommendations were only included if they could be reported and analysed as grams of ethanol. In many cases, such information was readily available via departments or institutes of public health, but in several cases such information was not easy to locate. Various non-government guidelines were found, including guidelines produced by non-profit interest groups (e.g., American Heart Association) or bodies representing alcohol producers (e.g., Hungarian Association for

Responsible Alcohol Consumption). However, these were not included in this review. Where more than one guideline was available for a country, and such guidelines differed, the advice from government departments was prioritised.

The WHO Global Status Report on Road Safety provided a comprehensive summary of alcohol consumption limits for drivers in 145 countries.[30]

When ranges were given or there was variation between jurisdictions within countries, the lower limits were preferred (e.g., Australian guidelines recommend no more than two standard drinks per day to reduce lifetime risk of harm and no more than four per day to reduce the risk of injury on single occasions).[25]

3.4. Results

3.4.1. Consumption guidelines for the general population

Twenty-seven of the 57 countries whose websites were searched were found to have official low risk drinking guidelines that could be expressed as grams of ethanol. Twelve countries have official guidelines for maximum weekly consumption for both men and women. Only 10 countries specify daily and weekly alcohol consumption maxima. The requirement that guidelines be specified in - or convertible into - grams of ethanol meant that it was not possible to include many countries:

- some countries refer to standard drinks, but do not define them in grams of ethanol (e.g., Kenya, Malta)
- some countries do not define standard drinks, but offer general guidance encouraging moderate alcohol consumption, and/or abstinence in certain circumstances (e.g., Belgium, India, Norway, Western Samoa).
- some countries do not have standard drinks or guidelines. This includes countries with majority Muslim populations where complete abstinence from alcohol and other intoxicants is encouraged or expected.

- However, several other countries - including 8 of the 27 EU member States - were found not to have readily accessible guidelines.

Table 1 summarises the findings of the review of available official definitions and guidelines - all measures of alcohol have been converted to grams of ethanol. There is wide variation in a "standard drink" or "unit of alcohol", from a maximum of 14g in Slovakia to a minimum of 8g in the United Kingdom (a ratio of 1.75:1). From Figure 1, it is immediately apparent that daily consumption guidelines are more common than weekly consumption guidelines, and that maxima tend to be greater for men than women. There was a significant correlation between the daily ($r_{(27)} = .83$, $p < .01$) and weekly ($r_{(12)} = .73$, $p = .01$) intake maxima for men and women, but for neither men ($r_{(10)} = -.10$, $p = .79$) nor women ($r_{(10)} = -.08$, $p = .84$) was there a significant association between daily and weekly intake maxima. Although the reliability of some of these correlations may be questionable due to the small number of observations, visual inspection of the data indicate inconsistent ratios of daily and weekly maxima. Unit size was not significantly correlated with daily guidelines (men $r_{(24)} = .14$, $p = .52$; women $r_{(24)} = .16$, $p = .46$) or weekly guidelines (men $r_{(11)} = -.42$, $p = .19$; women $r_{(11)} = -.50$ $p = .12$).

Table 1 shows considerable variation in national guidelines for maximum alcohol intake per day - the ratio of the smallest and largest daily maxima is 2.74:1 for men and 4.11:1 for women. The mean weekly intake maxima also show great variability: the ratio of the most generous to the least generous maxima is 1.94:1 among men and 1.75:1 among women. There is also wide variation in the male:female ratio of daily and weekly intake guidelines. In the 10 countries with recommended weekly and daily maxima, the mean weekly:daily maximum ratio is 5.58 for men and 5.40 for women. Some guidelines recommend alcohol-free days, and/or reducing daily consumption if drinking on more days per week, but many do not, and some clearly state weekly intake maxima that are simply 7 times the stated daily maximum.

Table 1 Variation in recommended standard units and maximum intake of alcohol (g ethanol)

	unit	daily			weekly			week : day ratio	
		male	female	m:f	male	female	m:f	male	female
USA	14	56	42	1.33	196	98	2.00	3.50	2.33
Mexico	—	48	36	1.33	144	108	1.33	3.00	3.00
Ireland	10	40	30	1.33	210	140	1.50	5.25	4.67
Estonia	10	40	20	2.00	160	80	2.00	4.00	4.00
Poland	10	40	20	2.00	280	140	2.00	7.00	7.00
Switzerland	10	40	20	2.00	—	—	—	—	—
Italy	12	36	24	1.50	—	—	—	—	—
South Africa	12	36	24	1.50	—	—	—	—	—
UK	8	32	24	1.33	—	—	—	—	—
Brazil	10	30	20	1.50	—	—	—	—	—
Bulgaria	10	30	20	1.50	—	—	—	—	—
France	10	30	20	1.50	210	140	1.50	7.00	7.00
Netherlands	10	30	20	1.50	—	—	—	—	—
New Zealand	10	30	20	1.50	210	140	1.50	7.00	7.00
Singapore	10	30	20	1.50	—	—	—	—	—
Spain	10	30	20	1.50	210	140	1.50	7.00	7.00
Slovakia	14	28	14	2.00	—	—	—	—	—
Canada	13.45	40.35	26.9	1.50	201.75	134.5	1.50	5.00	5.00
Austria	—	24	16	1.50	—	—	—	—	—
Czech Republic	—	24	16	1.50	—	—	—	—	—
Germany	12	24	12	2.00	—	—	—	—	—
Iceland	12	24	12	2.00	168	84	2.00	7.00	7.00
Australia	10	20	20	1.00	—	—	—	—	—
Portugal	10	20	20	1.00	—	—	—	—	—
Finland	12	20	10	2.00	—	—	—	—	—
Hong Kong	10	20	10	2.00	—	—	—	—	—
Slovenia	10	20	10	2.00	—	—	—	—	—
Denmark	12	—	—	—	168	84	2.00	—	—
Lithuania	10	—	—	—	—	—	—	—	—
Sweden	12	—	—	—	168	108	1.56	—	—
Mean	10.87	31.20	20.26	1.60	193.81	116.38	1.70	5.58	5.40
Median	10.00	30.00	20.00	1.50	198.88	121.25	1.53	6.13	6.00
Mode	10.00	30.00	20.00	1.50	210.00	140.00	2.00	7.00	7.00

There was little clear geographic patterning in relation to the alcohol content of standard drinks. However, daily intake maxima tended to be greater in "wet" European countries where alcohol consumption is integrated into daily life (e.g., Italy, Spain, France, Portugal) than in "dry" countries where alcohol is more commonly part of "time out" behaviour (e.g., UK, Scandinavia).[31] Furthermore, "wet" countries are less likely to issue weekly intake maxima.

3.4.2. Maximum blood alcohol content when driving

Figure 2 displays wide variation in restrictions on maximum blood alcohol content (BAC: grams per Litre of blood) for drivers. Of the 145 countries for which limits are available, 21 (14%) allow no alcohol in the blood of drivers. Among the 124 countries which allow drivers to have some alcohol in their blood, there is a 10-fold variation between the least and most generous. For these countries, the mean limit is 0.52 g/L, and the median and mode are 0.5 g/L. However, 4 countries allow drivers to have a BAC of 1.0 g/L - i.e., nearly double each of the three measures of central tendency just mentioned. BAC limits for young or novice drivers range from 0.0 g/L to 1.0 g/L: the mean is 0.46, the median is 0.5, and the mode is 0.8. BAC limits for professional drivers range from 0.0 g/L to 1.0 g/L: the mean is 0.47, the median is 0.5, and the mode is 0.8.

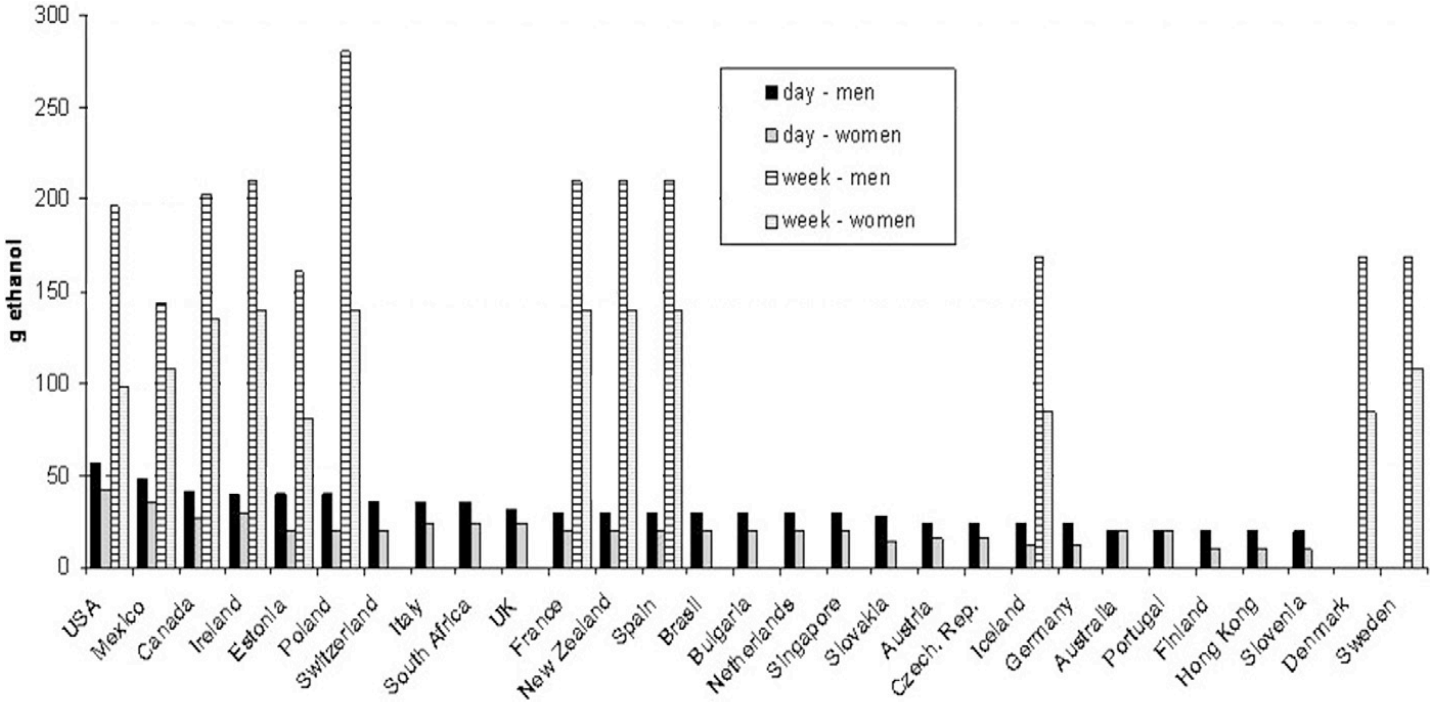
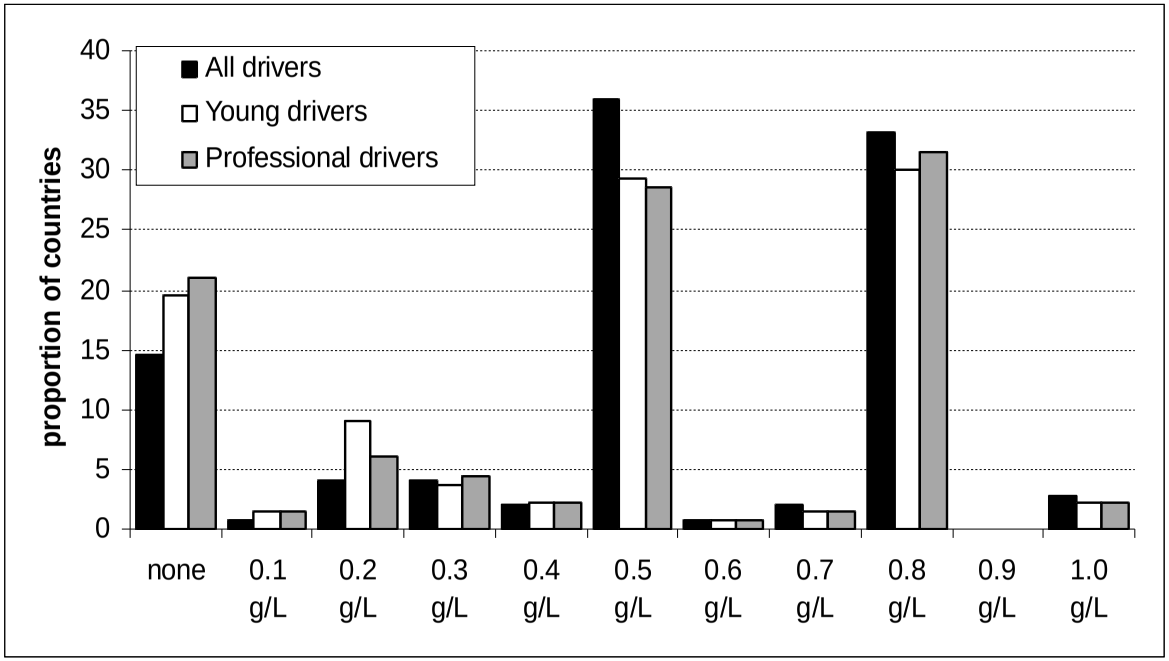


Figure 1. *International variation in recommended maximum intake of alcohol (expressed in grams of ethanol).*

Figure 2: International variation in maximum blood alcohol content (BAC: g/L) for drivers



A minority of countries (16%) specify lower BACs for young/novice drivers, and/or professional drivers: most apply one limit to all drivers regardless of age or experience. Zero BAC legislation is more common for young/novice drivers (20% of countries) and professional drivers (21%) than the general population (14%). The vast majority of countries that specify zero BAC limits for young/novice drivers or professional drivers also specify zero BAC for all drivers. There were strong significant correlations between the general population BAC and BAC for young/novice drivers ($r_{(133)} = .84, p < .01$) and professional drivers ($r_{(133)} = .86, p < .01$). Population BAC was not significantly related to daily alcohol intake maxima for men ($r_{(19)} = .06, p = .80$) or women ($r_{(18)} = -.07, p = .78$). Nor was population BAC significantly related to weekly alcohol intake maxima for men ($r_{(7)} = -.23, p = .63$) or women ($r_{(7)} = -.34, p = .45$) - although the number of observations for the latter analyses are too small to be reliable.

The wide variation in BAC limits is not easy to explain according to cultural or regional variation. However, there are some interesting clusters of limits. For example, no English-speaking countries have BAC limits below 0.5 g/L. Comparisons of geographical clusters revealed significant variation in BACs ($F_{(6, 139)} = 4.38, p < .01$): post hoc tests revealed two clusters of regions: the mean BACs for the Middle-East (0.42), Asia (0.42), and Europe (0.43), were significantly lower than those for North America (0.80), Oceania (0.68), South America (0.63), and Africa (0.42). However, there is also considerable variation within regions. For example, European countries span the range from 0.0 to 0.8g/L, and there is no obvious association between BAC limits and having “wet” or “dry” drinking cultures (Room & Mäkelä, 2000). There were significant differences in the mean BAC for countries where the majority of the population are Muslim and all other countries (0.35 vs 0.57; $F_{(1,144)} = 15.31, p < .01$). However, it should be noted that the legal BAC in both majority Muslim countries and other countries spanned the full range from zero to 1.0 g/L. It should also be noted that many majority Muslim countries do not specify a legal BAC given the assumption of abstinence.

3.4.3. Alcohol consumption during pregnancy and breastfeeding

In contrast to the large number of countries with official guidelines for alcohol consumption when driving, there is a paucity of government alcohol consumption guidelines for pregnant or breastfeeding women. However, all of the 14 countries with available published guidelines - Australia, Canada, France, Ireland, Italy, Kenya, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, UK, USA - recommend that the safest option during pregnancy is not to drink alcohol. Several countries emphasise that if women do drink, then they should limit the number of drinks per day and the number of drinking days per week. In addition, several countries specify that women should not drink alcohol during the first few months of a baby's life, and that they should not drink alcohol if they are planning to become pregnant.

3.5. Discussion

There is currently no international consensus about what a standard drink is, what low risk alcohol consumption is on a daily or weekly basis, or what the legal BAC should be for drivers. Although the WHO has suggested that pregnant women and drivers should be alcohol free,[19] and has issued some guidance on daily consumption,[26] the goal of harmonising definitions of standard drinks and consumption guidelines has not been achieved.[24] Furthermore, many countries simply do not issue such guidance, or do not provide readily-accessible information presented in forms that allow international comparisons.

A global system of units and low risk drinking guidelines could help people to make better-informed choices about alcohol consumption. However, our analyses indicate great variability in national guidelines. Furthermore, recent reviews reveal a lack of a consensus and consistency among researchers, health professionals, and the alcohol industry in relation to the meaning of terms such as "responsible drinking" and "binge drinking".[32-33] Such inconsistency may make it difficult for individuals to evaluate and monitor their own alcohol consumption.

Part of the reason for the lack of agreement in low risk drinking guidelines may be that the epidemiological data do not identify clear or consistent thresholds at which alcohol increases the likelihood of different harms. For most health risks, there appear to be linear associations suggesting benefits from any reduction in alcohol intake; for other health risks there appear to be thresholds below which alcohol use does not increase risk; for yet other health risks there appear to be curvilinear associations indicating beneficial effects of low or moderate alcohol consumption.[6-13] Thus, different levels of alcohol consumption may have differential effects on different health risks. Research has revealed that the same epidemiological data could be used to justify different intake guidelines depending on which outcome one is most concerned about.[25,34,35] Furthermore, thresholds and related guidance may vary depending on whether the outcome measure of interest is morbidity or mortality,[35, Re12] whether the focus is on short-term harm or harm accumulated over time, and whether the focus is on absolute or relative risk.[15,16,25,34] In relation to the latter point, it is notable that the development of new low risk drinking guidelines was based on absolute risk of harm in Australia,[15] but relative risk of harm in Canada,[16] and that these different foci resulted in different guidelines in the two countries. The task of identifying simple risk thresholds is made more difficult by the suggestion that the effects of quantity and frequency of alcohol consumption should be considered separately.[36] Very few published guidelines explain which of these various concerns were prioritised in their development. If such information were available, then it might be easier to understand and explain the current lack of consensus.[34]

There is no international agreement about whether women should drink as much as men or only half as much: even within the same countries different sex ratios are found for maximum daily and weekly consumption. Women tend to be more affected than men by the same dose of alcohol, a difference that is often explained by metabolic differences and body size and composition.[17-19] However, this cannot explain the observed variation in sex ratios for alcohol consumption: e.g., it is difficult to understand why the male:female daily maximum ratio is 2:1 in

Slovakia but 1.5:1 in the Czech Republic. One reason for such differences may be a focus on different risks within different time-frames, as reflected in the dual guidelines issued in Australia.[25,34,35]

A further marker of the lack of international consensus is the finding that in some countries the weekly maximum is simply seven times the daily maximum whereas in others there is an explicit statement or implicit assumption that drinkers should have at least one alcohol-free day each week. If national guidelines were based on the same epidemiological data, then there should not be such wide discrepancies in how the risks associated with different patterns of alcohol use are defined.

The current lack of consensus could be overcome. The data suggest that all countries could be encouraged to define a standard drink as 10g of ethanol. This would facilitate comparisons between epidemiological studies conducted in different countries. It would also make it easier for people living in a globalised world to develop and use transferable skills for monitoring and regulating their alcohol consumption. Based on the data presented here, it may make sense to standardise guidelines, and to recommend that:

- women should drink no more than 2 standard drinks per day
- men should drink no more than 3 standard drinks per day
- women should drink no more than 12 standard drinks per week
- men should drink no more than 18 standard drinks per week
- women and men should have at least one alcohol-free day per week
- motor vehicle drivers should not consume any alcohol
- pregnant and breastfeeding women should not consume any alcohol

Such guidelines reflect the mean and median of published official guidelines, are based on a consistent 1.5:1 male:female consumption ratio, and have embedded within them an expectation that people should not drink every day. Of course, these

guidelines are somewhat arbitrary. However, the guidelines suggested above would remove some of the ambiguities and inconsistencies in the existing range of arbitrary guidelines. They represent a middle-ground between new evidence-based Canadian guidelines focused on relative risk,[16] and the new evidence-based Australian guidelines focused on absolute risk.[15] However, further research may be needed to determine whether more specific guidance is required for older or younger drinkers whose capacity to process alcohol and to manage the effects of intoxication may differ from that of other adults.[37,38]

Effort to standardise guidelines is required. However, there are several reasons why there are not simple links between developing guidelines and changing people's behaviour. First, it has been observed that even when people are aware of available guidelines, they do not always possess accurate knowledge or the skills required to use them.[39-42] Furthermore, communication about alcohol-related risks must use terms that match the drinking experiences of the population.[26,43] For example, guidelines based on standard drinks may be difficult to apply in contexts and cultures with strong traditions of non-commercial production and consumption of alcohol,[44] or in contexts in which alcohol is served in non-standardised measures. Standard units may not easily map onto packaged products or self-poured drinks, which may not contain whole units (thus making unit counting more difficult) and are usually substantially more than one unit.[39,40] In addition, it must be acknowledged that motivation to get drunk and have fun are important predictors of alcohol consumption, and that health concerns often have little influence on people's alcohol consumption.[45-47] Attempts to use health-related messages to encourage moderate alcohol consumption are therefore likely to have limited success. Indeed, encouragement of moderation and restraint run counter to the contemporary cultural emphasis of excessive and conspicuous consumption.[43] An additional reason why there are not simple links between developing guidelines and reducing harm is that possession of more accurate information about alcohol units may facilitate more harmful consumption. For example, young people may use alcohol unit labelling to help them to select the most potent drinks.[48]

Despite these caveats, it is important that for people who do want to adhere to recommendations to drink responsibly, there should be internationally-agreed standard definitions of alcohol units and consumption guidelines. Agreed low risk drinking guidelines - perhaps following the recommendations suggested above - would facilitate consistent labelling of packaged products, and would be useful for international efforts to reduce alcohol-related harm by increasing people's capacity to monitor and regulate their alcohol consumption.

3.6. References

1 Batty GD, Hunt K, Emslie C, Lewars H, Gale CR. (2009) Alcohol problems and all-cause mortality in men and women: Predictive capacity of a clinical screening tool in a 21-year follow-up. *J Psychosom Res* **66**: 317-21.

2 Gmel G, Rehm J. (2003) Harmful Alcohol Use. *Alcohol Res Health* **27**: 52-62.

3 Jernigan DH, Monteiro M, Room R, Saxena S. (2000) Towards a global alcohol policy: alcohol, public health and the role of WHO. *Bull World Health Org* **78**, 491-9.

4 Rehm J, Room R, Monteiro M, et al. (2003) Alcohol as a Risk Factor for Global Burden of Disease. *Eur Addict Res* **9**, 157-64.

5 World Health Organization (2002) *World Health Report 2002*. Geneva: WHO.

6 Corrao G, Bagnardi V, Zambon A, La Vecchia C. (2004) A meta-analysis of alcohol consumption and the risk of 15 diseases. *Prev Med* **38**: 613-9.

7 Taylor B, Irving HM, Baliunas D, et al. (2009) Alcohol and hypertension: Gender differences in dose-response relationships determined through systematic review and meta-analysis. *Addiction* **104**: 1981-90.

8 Irving HM, Samokhvalov AV, Rehm J. (2009)Alcohol as a risk factor for Pancreatitis: A systematic review and meta-analysis. *J Pancreas* **10**: 387-92.

9 Britton A, Marmot M. (2004) Different measures of alcohol consumption and risk of coronary heart disease and all-cause mortality. *Addiction* **99**: 109-16.

10 Corrao G, Rubbiati L, Bagnardi V, Zambon A, Poikolainen K. (2000) Alcohol and coronary heart disease: A meta-analysis. *Addict* **95**: 1505-23.

11 Di Castelnuovo A, Costanzo S, Bagnardi V, et al. (2006) Alcohol dosing and total mortality in men and women: An updated meta-analysis of 34 prospective studies. *Arch Int Med* **166**: 2437-45.

12 Rodgers B, Korten AE, Jorm AF, Jacomb PA, Christensen H, Henderson AS. (2000) Non-linear relationships in associations of depression and anxiety with

alcohol use. *Psychol Med* **30**: 421-32.

13 Reynolds K, Lewis LB, Nolan JDL, et al. (2003) Alcohol consumption and risk of stroke: A meta-analysis". *J Am Med Assoc* **289**: 579-88.

14 Dufour MC. (1999) What is moderate drinking? Defining drinks and drinking levels. *Alcohol Res Health* **23**: 5-14.

15 Room R, Rehm J. (2012) Clear criteria based on absolute risk: reforming the basis of guidelines on low-risk drinking. *Drug Alcohol Rev* **31**:135-40.

16 Stockwell T, Butt P, Beirness D, Gliksman L, Paradis C. (2012) The basis for Canada's new low-risk drinking guidelines: a relative risk approach to estimating hazardous levels and patterns of alcohol use. *Drug Alcohol Rev* **31**:126-34.

17 Graham K, Wilsnack R, Dawson D, Vogeltanz N. (1998) Should alcohol consumption measures be adjusted for gender differences? *Addiction* **93**: 1137-47.

18 Mumenthaler MS, Taylor JL, O'Hara R, Yesavage JA. (1999) Gender differences in moderate drinking effects. *Alcohol Res Health* **23**: 55-64.

19 Taylor B, Irving HM, Kanteres F, et al. (2010) The more you drink, the harder you fall: a systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. *Drug Alcohol Depend* **110**:108-16.

20 Zador P, Krawchuk S, Voas R. (2000) *Relative Risk of Fatal Crash Involvement by BAC, Age and Gender*. Washington, DC: National Highway Traffic Safety Administration.

21 World Health Organization (2006). *Framework for Alcohol Policy in the WHO European Region*. Copenhagen: WHO.

22 Abel EL, Hannigan JH. (1995) Maternal risk factors in fetal alcohol syndrome: provocative and permissive influences. *Neurotoxicol Teratol* **17**: 445-62.

23 May PA, Gossage JP. (2001) Estimating the prevalence of fetal alcohol syndrome. A summary. *Alcohol Res Health* **25**:159-67.

24 Cabinet Office (2004). *Alcohol Harm Reduction Strategy for England*. London: Prime Minister's Strategy Unit.

25 National Health & Medical Research Council (2009) *Australian Guidelines to Reduce Health Risks from Drinking Alcohol*. Canberra: NHMRC.

26 Miller WR, Heather N, Hall W. (1991) Calculating standard drink units: international comparisons. *Br J Addict* **86**: 43-7.

27 World Health Organization (2010). *Strategies to Reduce the Harmful Use of Alcohol: Draft Global Strategy*. Available at: http://apps.who.int/gb/ebwha/pdf_files/WHA63/ A63_13-en.pdf (last access: 01/11/2010)

28 World Health Organization Regional Office for Europe (2011) *A healthy lifestyle*. Available at: http://www.euro.who.int/en/what-we-do/health-topics/disease-prevention/nutrition/a-healthy-lifestyle (last access 01/11/2011)

29 World Health Organization (1999) *European Alcohol Action Plan 2000-2005*. Copenhagen: WHO Regional Office for Europe.

30 World Health Organization (2009) *Global Status report on Road Safety*. Geneva: WHO.

31 Room R, Mäkelä K. (2000) Typologies of the cultural position of drinking. *J Stud Alcohol* **61**: 475-83.

32 Barry AE, Goodson P. (2010) Use (and misuse) of the responsible drinking message in public health and alcohol advertising: A review. *Health Educat Behav* **37**: 288-303.

33 Herring R, Berridge V, Thom B. (2008) Binge drinking: an exploration of a confused concept. *J Epidemiol Community Health* **62**: 476-9.

34 Rehm J, Patra J. (2012) Different guidelines for different countries? On the

scientific basis of low-risk drinking guidelines and their implications. Drug Alcohol Rev **31**:156-161.

35 Rehm J, Room R, Taylor B. (2008) Method for moderation: measuring lifetime risk of alcohol-attributable mortality as a basis for drinking guidelines. *Int J Methods Psychiatr Res* **17**, 141-51.

36 Breslow RA, Chen CM, Graubard BI & Mukamal KJ. (2011) Prospective Study of Alcohol Consumption Quantity and Frequency and Cancer-Specific Mortality in the US Population. *Am J Epidemiol* **174**:1044-53.

37 Royal College of Psychiatrists (2011). *Our Invisible Addicts*. London: Royal College of Psychiatrists.

38 Thompson KD, Stockwell T, MacDonald S. (2012). Is there a 'low-risk' drinking level for youth? The risk of acute harm as a function of quantity and frequency of drinking. *Drug Alcohol Rev* **31**:184-193.

39 de Visser RO, Birch J. (2012) My cup runneth over: Young people's lack of knowledge of low-risk drinking guidelines. *Drug Alcohol Rev* **31**: 206-212.

40 Devos-Comby L, Lange JE. (2008) "My drink is larger than yours"? A literature review of self-defined drink sizes and standard drinks. *Curr Drug Abuse Rev* **1**: 162-76.

41 Gill J, O'May F. (2006) People seem confused about sensible drinking messages. *BMJ* **332**: 302-3.

42 Office for National Statistics (2010) *Drinking: Adults' Behaviour and Knowledge in 2009*. Newport: ONS.

43 Measham F. (2006) The new policy mix: Alcohol, harm minimisation, and determined drunkenness in contemporary society. *Int J Drug Policy* **17**: 258-68.

44 Gual A, Martos AR, Lligoña A, Llopis, JJ. (1999) Does the concept of a standard drink apply to viticultural societies? *Alcohol Alcohol* **34**: 153-60.

45 Kuntsche E, Knibbe R, Gmel G, Engels R. (2005) Why do young people drink? A review of drinking motives. *Clin Psychol Rev* **25**: 841-61.

46 de Visser RO, Smith JA. (2007) Young men's ambivalence toward alcohol. *Soc Sci Med* **64**: 350-62.

47 Szmigin I, Griffin C, Mistral W, Bengry-Howell A, Weale L, Hackley C. (2008) Re-framing 'binge drinking' as calculated hedonism. *Int J Drug Policy* **19**: 359-66.

48 Jones SC, Gregory P. (2009) The impact of more visible standard drink labelling on youth alcohol consumption: Helping young people drink (ir)responsibly? *Drug Alcohol Rev* **28**: 230-4.

3.7. Appendix

Appendix 1 List of countries included in searched for consumption guidelines

European Union	**Africa**
Austria	Angola
Belgium	Democratic Republic of Congo
Bulgaria	Kenya
Cyprus	South Africa
Czech Republic	Tanzania
Denmark	
Estonia	**Asia**
Finland	India
France	Indonesia
Germany	Japan
Greece	Philippines
Hungary	Thailand
Ireland	
Italy	**Americas**
Latvia	Argentina
Lithuania	Brasil
Luxembourg	Canada
Malta	Mexico
Netherlands	United States of America
Poland	
Portugal	**Oceania**
Romania	Australia
Slovakia	Fiji
Slovenia	New Zealand
Spain	Western Samoa
Sweden	Vanuatu
United Kingdom	
Other Europe	**Middle East**
Iceland	Israel
Moldova	Jordan
Norway	Saudi Arabia
Russia	Syria
Switzerland	United Arab Emirates

Chapter 4

Motivation to adhere to unit-based guidelines for alcohol consumption, and ability to do so is limited among university students

4.1. Abstract

Aims: The first aim was to explore whether university students possess the information, motivation, and behavioural skills required to adhere to government guidelines for alcohol consumption expressed in "units" of alcohol. The second aim was to identify correlates of greater motivation to adhere to guidelines and greater capacity to monitor alcohol unit intake. **Methods:** An online questionnaire was completed by 614 university students aged 18-30 living in South-East England. Key outcome variables were motivation to adhere to unit-based guidelines, and a novel measure of accuracy of estimating recent alcohol unit intake. **Findings:** Respondents had poor knowledge of unit-based guidelines, and their motivation to adhere to them was low. Only half of the sample had the skills to accurately estimate the alcohol unit content of their recent alcohol consumption. Greater capacity to accurately estimate recent alcohol unit intake, and greater motivation to adhere to unit-based guidelines were related to psychological traits of greater conscientiousness and less extraversion, greater familiarity with unit-based guidelines and more positive attitudes toward them, and more moderate alcohol use. **Conclusions:** Taking into consideration people's beliefs and psychological traits could increase the effectiveness of health behaviour change strategies to curb alcohol consumption.

4.2. Introduction

There is a need to develop and implement measures to encourage people to reduce their alcohol consumption. Concern about negative consequences related to excessive alcohol use has often been focused on young adults - especially students in higher education (Szmigin et al., 2008; Webb et al., 1996). It has been documented that many students in higher education drink more than their non-student peers and often above the recommended guidelines for "low-risk drinking" (Gill, 2002; Jones & Gregory, 2009; Kypri et al., 2005) The higher prevalence of heavy drinking among students in higher education puts them a greater risk for significant negative health and social outcomes (Harford et al., 2002; Lee & Forsythe, 2011; Office for National Statistics (ONS), 2015). These issues are of particular concern within the UK's binge drinking culture where, despite the number of non-drinkers being on the rise among young adults, there are still many who drink excessively (Home Office, 2012; ONS, 2015; Piacentini & Banister, 2008).

The UK government has developed the "sensible drinking" message accompanied by guidelines in order to encourage moderate drinking within the general population (Department of Health, 1995; NHS Choices, 2015). Consumption of alcoholic drinks is measured in units of 10ml of pure ethyl alcohol. At the time of data collection, the advice from the Department of Health (1995) was that men should not drink more than 4 units and women should not exceed 3 units in any given day. In addition to these recommendations, both sexes should have at least 2 alcohol-free days (or 48 hours) each week (Department of Health, 1995; Gill & O'May, 2007a, NHS, 2015). Weekly unit intake was no longer part of the government guidelines. However many researchers defined excessive intake as more than 21 units per week for men and more than 14 units per week for women (Batty et al., 2009; Turner, 1990; Wettlaufer et al., 2012). Such recommendations have recently been revised with the daily guidelines abandoned and the weekly ones reinstated with a maximum of 14 units now recommended for both men and women (Department of Health, 2016). The unit-based drinking guidelines have been

advertised in many ways in the UK. Since 2011 at least 80% of alcohol product labels must state the unit content and the recommended daily intake maxima (Department of Health, 2011). Furthermore, national campaigns such as the Change4Life campaign that provides, in addition to the drinking guidelines, exercise and healthy eating tips (NHS Choices, 2015). Recently, some organisations have also provided individuals with glasses marked with the unit content of various drinks as well as the UK alcohol intake guidelines as a way to promote them (Furtwängler & de Visser, 2016).

However, UK research has shown that few drinkers have accurate knowledge of unit-based guidelines and that even fewer apply them to their own alcohol consumption, this lack of accurate knowledge results in people inaccurately estimating how much they drink (de Visser, 2015; de Visser & Birch, 2012; Gill & O'May, 2007b; ONS, 2015). Evidence also shows a general lack of awareness and use of the unit-based guidelines among UK students in higher education (Craigs et al., 2012; Gill & O'May, 2007b). Therefore, research is needed to identify why university students lack knowledge of unit-based guidelines and do not use them to regulate their own drinking.

Past research has identified key personality and attitudinal variables correlated with patterns of alcohol use. Studies of young people in the UK have revealed that determinants such as greater conscientiousness, greater self-efficacy, greater religiosity and greater age at onset of alcohol use are negatively correlated with alcohol consumption whereas more positive alcohol-related expectancies, stronger drinking motives, more favourable perceptions of prototypical drinkers, greater sensation-seeking and social norms more supportive of drinking are positively correlated with alcohol consumption (Atwell et al., 2011). Recent research into young people's beliefs about the effectiveness of various alcohol control strategies showed that older participants, those who expected more negative outcomes from alcohol and those who drank less alcohol had greater belief in the effectiveness of alcohol control strategies (de Visser et al., 2014). However, unlike the present

research, no studies to date have tested in the UK how these attitudes and personality dimensions are related to use of government guidelines for alcohol consumption. Attitudes can be defined as the predispositions and behavioural intentions (positives or negatives) that individuals automatically form based on their past experiences, media exposure and other types of socially supplied information (Eagly & Chaiken, 2006).

The Information-Motivation-Behavioral Skills (IMB) model (Fisher et al., 1994) was applied to frame the study reported here. This model proposes that in order to initiate and maintain healthy behaviours it is essential for people to possess relevant information, to be motivated to change and to possess the behavioural skills required to enact healthy behaviours (Furtwängler & de Visser, 2016). When applied to alcohol use and use of unit-based guidelines, the IMB highlights the importance of individuals having knowledge of the guidelines, being motivated to use them, and having the necessary behavioural skills, such as being able to accurately monitor unit intake (de Visser, 2015). Past studies have looked at certain components of knowledge of alcohol consumption guidelines, but none have focused on accuracy of estimating unit consumption on recent drinking days.

The aim of this study was to further explore the knowledge of, attitudes toward, and use of unit-based guidelines among university students in the UK and identify potential differences between men and women. Particular attention was given to determining rates and correlates of being able to accurately estimate recent unit intake (using a novel method to do so - comparing detailed reports of alcohol consumption on the most recent drinking day with estimates of the corresponding unit consumption) and being motivated to use unit-based guidelines for alcohol intake.

4.3. Methods

4.3.1. Procedure and sample

The data presented here come from a mixed-methods study of alcohol use and knowledge of unit-based guidelines in students attending a University based in South-East England. This study was granted ethical approval by the host institution and was carried out during the winter and summer semesters of the academic year in 2011. Participants were 614 university students (415 women and 199 men aged 18-30), all drinkers, who were recruited through an online participant pool and advertisements on campus. The sample was predominantly white (85.8%) with the most represented area subject (40%) being psychology. Individuals interested in participating were directed to an online information sheet and consent form. Once informed consent was obtained, participants were given access to an online questionnaire. All responses were anonymous and as an incentive participants had the option to either receive research participation credits towards their degree (for psychology students only) or to be entered into a ballot for a £25 spending voucher.

4.3.2. Questionnaire

One key outcome variable was **accuracy of estimates** of recent unit consumption. Participants were asked to describe as precisely as possible the type, brand and quantity of alcohol they had consumed on the most recent day on which they drank alcohol (e.g. two pints of Stella Artois, and a shot of Tequila). They were then asked to estimate how many units of alcohol this represented. Participants' reports of their alcohol intake were used by the researchers to calculate the actual number of units consumed. This was then compared to the participants' estimate to allow them to be categorised as being accurate (if the estimate was within ± 10% of the actual figure), underestimates (if the estimate was > 10% less than actual intake), or overestimates (if the estimate was > 10% more than actual intake).

Motivation to use unit-based guidelines for alcohol consumption was

assessed with the item “how motivated are you to adhere to the government guidelines when you drink?”. Respondents used a 5-point Likert scale (end-points “not at all” and “extremely”) and higher scores indicated a stronger motivation to use the guidelines.

Two aspects of personality were assessed. The root phrase “please indicate how often the following apply to you...” was followed by 10 items in each of two domains: **Conscientiousness** (Cronbach ⋄ = .80; e.g., “I pay attention to details”); and **Extraversion** (Cronbach ⋄ = .89; e.g., “I talk to a lot of different people at parties”) (Goldberg, 1992). For both of these scales, respondents used 5-point Likert scales (end-points “very inaccurate” and “very accurate”), with higher scores indicating greater conscientiousness and extraversion.

Alcohol Outcome Expectancies (AOE) were assessed with 27 items in two subscales (Leigh & Stacy, 1993). Respondents used 5-point Likert scales (end-points: “no chance” and “certain to happen”) to respond to statements on both scales. The AOE-positive scale contained 16 items such as “when people drink alcohol they have a good time”. It had good internal consistency (Cronbach $\alpha = .80$), and higher scores indicated a stronger belief that drinking is linked to positive outcomes. The AOE-negative scale contained 11 items such as “when people drink alcohol they behave badly”. It had good internal consistency (Cronbach $\alpha = .75$), and higher scores indicated a stronger belief that drinking is linked to negative outcomes.

Participants' **knowledge of the government guidelines** was assessed with four items adapted from Author (Birch & de Visser, 2012). After the stem “What are the government guidelines for maximum DAILY alcohol intake?” respondents used drop down menus with options ranging from 1 unit to 12 units to complete 2 statements “[Men/women] are advised to drink no more than ... units a day”. After the stem “What are the government guidelines for maximum WEEKLY alcohol intake?” respondents used drop down menus with options 1 unit, 4, 7, 11, ... 31. 34. 37 units to complete 2 statements “[Men/women] are advised to drink no more than ... units a week”.Respondents also responded to the question “One unit of alcohol consists of

what amount of pure alcohol?" using a drop-down menu with the following options: 0.1mL / 0.08g; 0.5mL / 0.4g;. 1mL / 0.8g; 5mL / 4g;. 10mL / 8g; 50mL / 40g;. 100mL / 80g.Correct responses to these items were summed, so that higher scores indicated better knowledge.

Familiarity with the guidelines was assessed with one item adapted from Author (20XX): "How familiar are you with the concept of "units" of alcohol?" Participants used a 5-point Likert scale (anchors: "not at all", "extremely") and higher scores indicated a higher familiarity with the concept of units.

Perceived usefulness of the guidelines was assessed with one item adapted from Author (20XX): "How useful to you is the concept of 'units' of alcohol". A 5-point Likert scale was used (end-points: "not at all" and "extremely") and higher score indicated participants finding the concepts of units more useful.

Frequency of counting units was assessed with one item ("how often do you count how many units you have consumed?") and **frequency of using the guidelines** was assessed with the following item: "how often do you use government guidelines to monitor your alcohol consumption?". 5-point Likert scales were used for both (end-points: "never" and "always") and higher scores indicated a higher frequency of counting units and using the guidelines.

Participants' alcohol consumption within the last week was assessed by asking them to report how many units of alcohol they had on each of the last seven days. They completed this task with the aid of a guide to the unit content of various drinks. This task was presented after the assessment of participants' knowledge of the government guidelines, and the questionnaire was set up to forbid backtracking so that participants could not return to earlier pages to correct incorrect responses to knowledge questions. Reports of unit consumed on each day in the last week were summed to give the **total unit intake for that week**. A single item adapted from de Visser & Birch (2012) assessed **frequency of getting drunk** in the last month.

For a comprehensive account of all the variables measured refer to a copy of the

full questionnaire (see Appendix D).

4.3.3. Analytic approach

Initially, One-way ANOVAs were conducted to identify correlates of giving accurate estimates of unit consumption rather than under- or over-estimates. Scheffé post hoc comparisons were used to identify significant differences between the three groups. We also planned to run a multinomial regression to identify the significant multivariate correlates explaining the variance in participants' group membership (accurate, under- or over-estimator).

A correlation matrix was used to investigate the association between all putative correlates of beliefs about, and use of unit-based guidelines. Particular attention was given to correlates of motivation to adhere to unit-based guidelines. Multivariate linear regression was then conducted to identify significant multivariate correlates of motivation to use the guidelines based on the significant correlates identified in the correlation matrix.

Data for continuous variables were checked for breaches of assumptions of normality. Except for the number of units consumed in the last week, the skewness values of all variables ranged between ±2 which is deemed acceptable (Field, 2009). Using z- score method, 7 outliners (bigger than a ±3 standard deviation) were identified for this variable and replaced with the value of the mean number of units consumed (19). The analyses with the new transformed variable were re-run but there was no significant change in the results found. Since the variable could not be transformed to normal successfully, the raw data were used. Preliminary analyses were conducted to determine whether to run separate analyses for women and men. Due to the number of analyses carried out, we adopted a stricter p-value of $p < 0.01$.

4.4. Results

Analyses displayed in Table 1 show that generally scores were around or below the midpoint of each scale. Respondents' knowledge of the unit-based guidelines was a mean score of 2.1 on a 0-4 scale. Respondents' mean familiarity with the guidelines score was 2.9 out of 5. They did not find them very useful, with a mean score of 2.5 out of 5. Even fewer reported counting units or using the guidelines to monitor their own alcohol intake, with respective mean scores of 1.8 and 1.3 out of 5. Motivation to adhere to the guidelines was a mean score of 1.7, which is below the mid-point of the 5-point scale.

In addition to having limited knowledge, negative attitudes and low motivation, participants' ability to accurately estimate unit content was as follows: approximately a third (30.5%) of the respondents gave accurate estimates of their unit intake, 35.2% gave underestimates, and 34.4% gave overestimates.

Table 1 Sex differences in variables

	Women (n=415)	**Men** (n=199)	**Sample** (n=614)		Effect size
	mean (s.d.)	mean (s.d.)	mean (s.d.)		
Positive outcome expectancy[a]	3.63 (0.35)	3.66 (0.41)	3.64 (0.37)	$t_{(336.65)}$ = -1.01, p = .31	d = -0.11
Negative outcome expectancy[a]	3.47 (0.37)	3.42 (0.42)	3.45 (0.38)	$t_{(612)}$ = 1.39, p = .17	d = 0.11
Conscientiousness[a]	3.40 (0.63)	3.35 (0.61)	3.39 (0.62)	$t_{(612)}$ = 1.09 , p = .28	d = 0.09
Extraversion[a]	3.28 (0.71)	3.39 (0.68)	3.32 (0.70)	$t_{(612)}$ = -1.86 , p = .06	d = -0.15
Knowledge of guidelines[b]	2.09 (1.20)	2.18 (1.34)	2.12 (1.25)	$t_{(355.04)}$ = -0.82 , p = .41	d = -0.09
Familiarity with guidelines[a]	2.69 (1.13)	3.24 (1.16)	2.87 (1.17)	$t_{(612)}$ = -5.60, p < .01	d = -0.45
Perceived utility of guidelines[a]	2.44 (1.25)	2.62 (1.27)	2.50 (1.18)	$t_{(346.37)}$ = -1.70 , p = .09	d = -0.18
Frequency of counting units[a]	1.72 (1.10)	1.83 (1.11)	1.76 (1.11)	$t_{(612)}$ = -1.14 , p = .25	d = -0.09
Frequency of using the guidelines[a]	1.31 (0.74)	1.37 (0.84)	1.33 (0.77)	$t_{(612)}$ = -0.95 , p = .34	d = -0.08
Motivation to use guidelines[a]	1.68 (0.96)	1.59 (0.98)	1.65 (0.97)	$t_{(612)}$ = 1.16 , p = .25	d = 0.09
How easy to use guidelines[a]	3.32 (1.21)	3.44 (1.33)	3.36 (1.25)	$t_{(359.54)}$ = -1.05, p = .30	d = -0.11
Units consumed in last week	15.12 (13.34)	22.66 (18.35)	17.57 (18.43)	$t_{(301.76)}$ = -5.12 , p < .01	d = -0.47
Frequency of being drunk last month	4.74 (4.88)	5.53 (5.30)	5.00 (5.03)	$t_{(363.48)}$ = -1.77, p = .08	d = -0.19
Actual units consumed on most recent drinking day	7.56 (4.97)	10.75 (8.62)	8.70 (7.04)	$t_{(262.95)}$ = -4.83, p < .01	d = -0.60
Accuracy of estimate of unit intake				$\chi^2_{(2)}$ = 6.40 , p = .04	V = 0.07
underestimate	34.7%	36.2%	35.2%		
correct	33.5%	24.1%	30.5%		
overestimate	31.8%	39.7%	34.4%		

a - range = 1-5
b - range = 0-4

The data in Table 1 show that there were few sex differences in personality variables, knowledge, attitudes and beliefs about unit-based guidelines, frequency of use of the guidelines and patterns of alcohol consumption. Significant differences (with medium effect sizes) were that men reported greater familiarity with the unit-based guidelines and consumed more units on the most recent drinking day and in the last week. There were no significant differences between men and women on motivation to adhere to the guidelines and level of accuracy; therefore analyses were conducted on the whole sample.

The only significant correlate of giving accurate estimates of unit intake was the level of familiarity (Table 2). Participants who accurately estimated their unit alcohol intake were more familiar with the guidelines than respondents who underestimated. Accuracy of estimation was not significantly related to positive or negative expectancies towards alcohol, how much respondents knew about the unit-based guidelines, how motivated they were to use the guidelines, nor how often they used them. Personality determinants such as conscientiousness and extraversion and patterns of alcohol consumption did not have a significant influence on the respondents' ability to estimate their unit alcohol intake. Because only one bivariate correlate was significant, the planned multinomial regression was not conducted.

Table 2 Correlates of accurate estimation of unit intake on most recent drinking day

	underestimate mean (s.d.)	**accurate** mean (s.d.)	**overestimate** mean (s.d.)	**difference**	**effect size**
Positive outcome expectancy[a]	3.64 (0.36)	3.67 (0.37)	3.61 (0.37)	$F_{(2,611)} = 1.58$, $p = .21$	$h^2 = 0.01$
Negative outcome expectancy[a]	3.44 (0.43)	3.45 (0.34)	3.46 (0.38)	$F_{(2,611)} = 0.09$, $p = .92$	$h^2 < 0.01$
Conscientiousness[a]	3.39 (0.64)	3.38 (0.59)	3.40 (0.64)	$F_{(2,611)} = 0.08$, $p = .93$	$h^2 < 0.01$
Extraversion[a]	3.26 (0.74)	3.32 (0.69)	3.37 (0.68)	$F_{(2,611)} = 1.37$, $p = .26$	$h^2 < 0.01$
Knowledge of guidelines[b]	2.02 (1.14)	2.26 (1.29)	2.11 (1.32)	$F_{(2,611)} = 1.93$, $p = .15$	$h^2 = 0.01$
Familiarity with guidelines[a]	2.71 (1.21)[c]	3.09 (1.11)[d]	2.83 (1.15)	$F_{(2,611)} = 5.49$, $p < .01$	$h^2 = 0.02$
Perceived utility of guidelines[a]	2.40 (1.18)	2.59 (1.10)	2.51 (1.24)	$F_{(2,611)} = 1.46$, $p = .23$	$h^2 < 0.01$
Frequency of counting units[a]	1.82 (1.16)	1.79 (1.14)	1.66 (1.02)	$F_{(2,611)} = 1.27$, $p = .28$	$h^2 < 0.01$
Frequency of use of guidelines[a]	1.35 (0.81)	1.28 (0.68)	1.35 (0.82)	$F_{(2,611)} = 0.47$, $p = .63$	$h^2 < 0.01$
Motivation to use guidelines[a]	1.73 (1.03)	1.52 (0.83)	1.70 (1.00)	$F_{(2,611)} = 2.67$, $p = .07$	$h^2 = 0.01$
How easy to use guidelines[a]	3.32 (1.26)	3.41 (1.24)	3.36 (1.27)	$F_{(2,611)} = 0.24$, $p = .79$	$h^2 < 0.01$
Units consumed in last week	18.74 (17.01)	17.17 (13.72)	16.75 (15.51)	$F_{(2,611)} = 0.96$, $p = .38$	$h^2 = 0.01$
Freq. drunk within last month	4.52 (5.06)	5.32 (4.82)	5.19 (5.16)	$F_{(2,611)} = 1.53$, $p = .22$	$h^2 = 0.01$
Actual units consumed on most recent drinking day	9.19 (7.49)	8.97 (6.09)	7.65 (5.79)	$F_{(2,611)} = 3.42$, $p = .03$	$h^2 = 0.01$

mean scores with different superscripts are significantly different

c - range = 1-5 d - range = 0-4

The correlation matrix in Table 3 displays the degree of association between all putative correlates of beliefs about, and use of unit-based guidelines. In the discussion that follows, particular attention is given to correlates of motivation to adhere to unit-based guidelines. Greater motivation to adhere to the guidelines was significantly related to greater conscientiousness, less extraversion, better knowledge of the guidelines, greater familiarity with the guidelines, greater perceived utility of the guidelines, more frequent counting of units, more frequent use of the guidelines, greater perceived use of the guidelines, consuming fewer units in the last week, and getting drunk less frequently in the last month.

Five significant independent multivariate correlates (Table 4) were identified that explained 41% of the variance in motivation to use the guidelines ($F_{(10, 601)} = 41.65$, $p < .01$; $R^2 = .41$). Stronger motivation to adhere to government guidelines for alcohol intake was related to greater conscientiousness, greater perceived usefulness of the guidelines but also greater use of them. Participants who were less familiar with the guidelines and reported getting drunk fewer times in the last month showed greater motivation to adhere to the drinking guidelines.

Table 3 Correlations between key variables, including motivation to adhere to unit-based guidelines

		1	2	3	4	5	6	7	8	9	10	11	12
1.	Positive AOE	-											
2.	Negative AOE	r = .40 p < .01	-										
3.	Conscientiousness	r = -.07 p = .07	r = .05 p = .19	-									
4.	Extraversion	r = .05 p = .21	r = .00 p = .98	r = -.11 p < .01	-								
5.	Knowledge of guidelines	r = -.11 p < .01	r = -.07 p = .08	r = .07 p = .09	r = -.04 p = .39	-							
6.	Familiarity with guidelines	r = -.06 p = .15	r = -.08 p = .05	r = .04 p = .31	r = .03 p = .45	r = .25 p < .01	-						
7.	Perceived usefulness of guidelines	r = -.08 p = .04	r = .09 p = .03	r = .09 p = .02	r = .01 p = .90	r = .22 p < .01	r = .50 p < .01	-					
8.	Frequency of counting units	r = -.40 p = .32	r = .11 p < .01	r = .13 p < .01	r = -.06 p = .12	r = .21 p < .01	r = .37 p < .01	r = .46 p < .01	-				
9.	Frequency of use guidelines	r = -.06 p = .12	r = .07 p = .09	r = .19 p < .01	r = -.11 p < .01	r = .13 p < .01	r = .37 p < .01	r = .33 p < .01	r = .59 p < .01	-			
10.	How easy to use guidelines	r = -.19 p < .01	r = .03 p = .45	r = .18 p < .01	r = -.15 p < .01	r = .09 p = .02	r = .17 p < .01	r = .21 p < .01	r = .20 p < .01	r = .18 p < .01	-		
11.	Units consumed last week	r = .11 p < .01	r = -.12 p < .01	r = -.26 p < .01	r = .21 p < .01	r = --.04 p = .35	r = .06 p = .14	r = -.08 p = .06	r = -.14 p < .01	r = -.16 p < .01	r = -.32 p < .01	-	
12.	Frequency of being drunk last month	r = .16 p < .01	r = -.05 p = .19	r = -.26 p < .01	r = .22 p < .01	r = -.08 p = .06	r = .00 p = .99	r = -.11 p < .01	r = -.17 p < .01	r = -.20 p < .01	r = -.31 p < .01	r = .61 p < .01	-
13.	Motivation to use guidelines	r = -.07 p = .09	r = .10 p = .02	r = .26 p < .01	r = -.18 p < .01	r = .11 p < .01	r = .12 p < .01	r = .29 p < .01	r = .41 p < .01	r = .58 p < .01	r = .25 p < .01	r = -.26 p < .01	r = -.30 p < .01

Table 4 Significant multivariate correlates of motivation to use unit-based guidelines

	B (s.e.)	**ß**	***t***
Conscientiousness	0.15 (0.05)	0.10	2.92, p < .01
Extraversion	-0.09 (0.05)	-0.06	-1.96, p = .05
Knowledge of guidelines	0.01 (0.03)	0.01	0.37, p = .71
Familiarity with guidelines	-0.09 (0.03)	-0.11	-2.80, p < .01
Perceived utility of guidelines	0.10 (0.03)	0.12	3.14, p < .01
Frequency of counting units	0.06 (0.04)	0.06	1.51, p = .13
Frequency of use of guidelines	0.58 (0.05)	0.46	11.63, p < .01
How easy to use guidelines	0.06 (0.03)	0.07	2.15, p = .04
Freq. drunk within last month	-0.02 (0.01)	-0.11	-2.70, p < .01
Units consumed in last week	-0.01 (0.02)	-0.04	-0.89, p = .37

4.5. Discussion

The aim of this study was to identify the correlates of accurately assessing the unit content of own alcohol intake and motivation to use government guidelines for alcohol consumption. A further aim was to better understand the attitudes and personality dimensions related to the government's guidelines in a sample of UK students.

The IMB model was used to focus the study and frame the analyses. In relation to the "Information" component of the IMB model, the data revealed - in line with previous research (e.g., de Visser, 2015; de Visser & Birch, 2012) - that respondents had limited knowledge of the unit-based guidelines.

In relation to the "motivation" component of the IMB model, the findings were similar to research from Kerr and Stockwell (2012). The data presented here revealed that the overall motivation to adhere to unit-based guidelines was low. Evidence has shown that people's low motivation to adhere to the guidelines stemmed from the fact that these recommendations lacked relevance to their drinking practices and their experience as drinkers. Drinking motives need to be taken into consideration because when people drink to get intoxicated, unit based drinking guidelines are likely to be perceived as unrealistic and irrelevant (de Visser et al., 2014; Lovatt et al., 2015). Furthermore, students often concentrate their alcohol consumption over one or two days a week (Maggs et al., 2011) which may explain why daily guidelines do not match the way they drink and why they lack motivation to adhere to them.

Analyses related to the final "behavioural skills" component of the IMB model showed that only 30.5% of the sample were able to accurately estimate their alcohol intake in terms of units. Approximately one-third underestimated how many units they had consumed on their last drinking occasion by at least 10%, and another third overestimated their unit intake. Although, from a public health perspective the main group of concern is the people who underestimated their unit intake, our results

highlight the fact that the majority (64.4%) of our participants were not able to accurately use the units of alcohol system in order to estimate and/or regulate their own consumption. This corroborates previous research showing that participants did not possess the adequate skills to accurately estimate the alcohol unit content of different beverages (de Visser & Birch, 2012; Kerr et al., 2005; Wilkinson et al., 2011). Our results showed that the main determinant of accuracy of estimates of unit content was familiarity which is in line with previous research indicating that accurate estimates of units were linked with familiarity with and knowledge of the guidelines (Furtwängler & de Visser, 2016). Recent research has also provided evidence that people regulate their drinking in ways that make sense to them and that units may be a flawed metric system for people who tend to monitor their consumption in numbers of drinks or containers rather than units (Lovatt et al., 2015; de Visser et al., 2014). This might also explain why some of our participants struggled to estimate their own unit alcohol intake.

One strength of this study was the successful deployment of a novel method for assessing accuracy of estimates of unit intake. A further was the use of the IMB model to identify key cognitive and behavioural factors related to likely adherence to government guidelines for alcohol consumption. However, the study had some limitations. These include the fact that the sample was composed of young adult students and that there was an over-representation of female participants. The sample was self-selected and composed by 40% of psychology students which might be explained by the incentive for them to receive course credits in exchange of their participation. A bias might also have been created by the fact that students in this subject area may be more familiar and have a greater interest in health related behaviour change measures such as the government's drinking guidelines. Future research could investigate similar issues in a non-student population and in adults later in life. Another limitation was that the analyses were based on self-report of alcohol consumption which is not always most accurate (but see Del Boca & Darkes, 2003). Using a survey has its own limitations, as such methods do not allow examination of why people lack motivation to adhere to unit-based guidelines, do

not perceive them to be useful or easy to use. In depth interviews could help complementing the present results and investigate further why people are not familiar with the guidelines, lack motivation and the skills to apply them to estimate the unit content of their own alcohol consumption (Furtwängler & de Visser, 2016). It is also a possibility that participants had access to information (e.g. online) to answer questions about the government's drinking guidelines which might have skewed and increase participants' scores of knowledge. However, with the participants obtaining an average score of 2.12 (out of a possible 5), and with higher scores indicating better knowledge we feel that it was not a recurrent occurrence.

Finally, future research could explore the impact of the new UK recommendations on 'safe levels of alcohol consumption' on people's motivation to adhere to them and their ability to do so.

4.6. Conclusion

It is essential to develop new interventions to encourage people to curb their alcohol intake. Previous research found that most people were aware of the unit-based guidelines and the recommendations for low-risk drinking but were not able to recollect them properly and lack the skills to apply them to their own drinking (de Visser, 2015; de Visser & Birch, 2012; Gill & O'May, 2007; ONS, 2015).

The implications are that more information about the guidelines for the general population is needed - perhaps through new prevention campaigns. Health behaviour change interventions need to enhance young people's motivation to adhere to such guidelines, but also need to help people to develop the skills required to apply them to their own drinking. For example, a recent study has shown that a drink-pouring exercise combined with personalized feedback could help improve people's knowledge of and adherence to low risk drinking guidelines (de Visser, 2015). Lastly, the research presented here showed that there is a need to improve motivation and the skills required to monitor unit intake in young adults. It also highlighted that familiarity with the guidelines played a significant role on people's ability to estimate own unit

consumption and that attitudes toward them played a role in their motivation to adhere to them. Implementing measures to improve young adults' familiarity with, and to enhance positive attitudes toward the drinking guidelines might be the best way forward. With the recent revisions of the drinking guidelines in the UK, we think that the government has a great opportunity to promote them appropriately in order to raise awareness and familiarity in the general population and also among young adults.

4.7. References

Atwell, K., Abraham C., & Duka, T. (2011). A parsimonious integrative model of key psychological correlates of UK university students' alcohol consumption. Alcohol & Alcoholism, 46, 253-260. doi: 10.1093/alcalc/agr016

Batty, D. G., Lewars, H., Emslie, C., Gale, C., & Hunt, C. (2009). Internationally recognized guidelines for "sensible" alcohol consumption: is exceeding them actually detrimental to health and social circumstances? Evidence from a population-based cohort study. Journal of Public Health, 31, 360-365. doi: 10.1093/pubmed/fdp063

Craigs, C. L., Bewick, B. M., Gill, J., O'may, F., & Radley, D. (2012) UK student alcohol consumption: A cluster analysis of drinking behaviour typologies. Health Education Journal, 71, 516-526. doi: 10.1177/0017896911406967

Department of Health (December 1995), 'Sensible Drinking – The report of an Inter-Departmental Working Group', DH, London, p. 24.

Department of Health (2011). Public health responsibility deal: alcohol pledges. Available at: https://responsibilitydeal.dh.gov.uk/alcohol-pledges/ (Accessed 12 January 2016).

Department of Health (2016). UK Chief Medical Officers' Alcohol Guidelines Review. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/489795/summary.pdf (Access 13 January 2016).

de Visser, R. (2015). Personalized feedback based on a drink-pouring exercise may improve knowledge of, and adherence to, government guidelines for alcohol consumption. Alcoholism, clinical and experimental research, 39, 317-323. doi: 10.1111/acer.12623

de Visser, R. O., & Birch, J. D. (2012). My cup runneth over: Young people's lack of knowledge of low-risk drinking guidelines. Drug and Alcohol Review, 31,

206-212. doi: 10.1111/j.1465-3362.2011.00371.x

de Visser, R. O., Hart, A., Abraham, C., Memon, A., Graber, R., & Scanlon, T. (2014) Which alcohol control policies do young people think are effective? Drug & Alcohol Review, *33*, 144-151. doi: 10.1111/dar.12109

Del Boca, F .K., & Darkes, J. (2003). The validity of self-reports of alcohol consumption: state of the science and challenges for research. Addiciton, 98, 1-12. doi: 10.1046/j.1359-6357.2003.00586.x

Fisher, J. D., Fisher, W. A., Williams, S. S., & Malloy, T.E. (1994). Empirical tests of an information-motivation-behavioral skills model of AIDS-preventive behavior with gay men and heterosexual university students. Health Psychology, 13, 238-250. doi: 10.1037/0278-6133.13.3.238

Furtwängler, N. A. F., & de Visser, R. (2016). University Students' beliefs about unit-based guidelines: A qualitative study. Manuscript submitted for publication.

Gill, J. (2002). Reported Levels of Alcohol Consumption and Binge Drinking within the UK Undergraduate Student Population over the last 25 Years. Alcohol and Alcoholism, 37, 109 –120. doi: 10.1093/alcalc/37.2.109

Gill, J., & O'May, F. (2007a). Practical demonstration of personal daily consumption limits: a useful intervention tool to promote responsible drinking among UK adults? Alcohol and Alcoholism, 42, 436-444.

Gill, J., & O'May, F. (2007b). How 'sensible' is the UK Sensible Drinking message? Preliminary findings amongst newly matriculated female university students in Scotland. Journal Of Public Health, 29, 13-16. doi: 10.1093/pubmed/fdl080

Harford, T. C., Wechsler, H. & Muthen, B. O. (2002). The impact of current residence and high school drinking on alcohol problems among college students. Journal of Studies on Alcohol, 63, 271–279.

Home Office (2012) The Government's Alcohol Strategy. Available at:

https://www.gov.uk/government/publications/alcohol-strategy (accessed on 07 June 2015).

Jones, S. C. & Gregory, P. (2009). The impact of more visible standard drink labelling on youth alcohol consumption: helping young people drink (ir)responsibly? Drug & Alcohol Review, 28, 230-234. doi: 10.1111/j.1465-3362.2008.00020.x

Kerr, W. C., & Stockwell, T. (2012). Understanding standard drinks and drinking guidelines. Drug and Alcohol Review, 31, 200–205. doi: 10.1111/j.1465-3362.2011.00374.x

Kerr, W. C., Greenfield, T. K., Tujague, J., & Brown, S. E. (2005). A Drink Is A Drink? Variation in the Amount of Alcohol Contained in Beer, Wine and Spirits Drinks in a US Methodological Sample. Alcoholism: Clinical and Experimental Research, 29, 2015-2021. doi: 10.1097/01.alc.0000187596.92804.bd

Kypri, K., Cronin, M., & Wright, C. S. (2005). Do university students drink more hazardously than their non-student peers? Addiction, 100, 713-714. doi: 10.1111/j.1360-0443.2005.01116.x

Lee, G. A., & Forsythe, M. (2011). Is alcohol more dangerous than heroin? The physical, social and financial costs of alcohol. International Emergency Nursing, 19, 141-145.

Lovatt, M., Eadie, D., Meier, P. S., Li, J., Bauld, L., Hastings, G., & Holmes, J. (2015). Lay epidemiology and the interpretation of low-risk drinking guidelines by adults in the United Kingdom. Addiction, 110, 1912-9. doi: 10.1111/add.13072

Maggs, J. C., Williams, L. R., & Lee, C. M. (2011). Ups and downs of alcohol use among first-year college students: Number of drinks, heavy drinking, and stumble and pass out drinking days. *Addictive Behaviours*, *36*(3), 197-202. doi: 10.1016/j.addbeh.2010.10.005

NHS Choices (2015) Alcohol units - Live Well - NHS Choices. Retrieved from: http://www.nhs.uk/Livewell/alcohol/Pages/alcohol-units.aspx (accessed 15 June 2015).

NHS (2015) Track your drinks with our free smartphone app | Change4Life. Available from: http://www.nhs.uk/Change4Life/Pages/drinks-tracker-mobile-app.aspx (accessed 15 June 2015).

Office for National Statistics (2015) Adult Drinking Habits in Great Britain, 2013. Available at: http://www.ons.gov.uk/ons/rel/ghs/opinions-and-lifestyle-survey/adult-drinking-habits-in-great-britain--2013/stb-drinking-2013.html (accessed 07 June 2015).

Piacentini, M. G., & Banister, E. N. (2008.) Managing anti-consumption in an excessive drinking culture. Journal of Business Research, 62, 279-288. doi: 10.1016/j.jbusres.2008.01.035

Szmigin, I., Griffin, C., Mistral, W., Bengry-Howell, A., Weale, L., & Hackley, C. (2008). Re-framing "binge drinking" as calculated hedonism: empirical evidence from the UK. International Journal of Drug Policy, 19, 359-366. doi: 10.1016/j.drugpo.2007.08.009

Turner, C. (1990). How much alcohol is in a "standard drink"? An analysis of 125 studies. British Journal of Addiction, 85, 1171-1175. doi: 10.1111/j.1360-0443.1990.tb03442.x

Webb, E., Ashton. C. H., Kelly, P., & Kamali, F. (1996). Alcohol and drug use in UK university students. The Lancet, 348, 922-925. doi: 10.1016/S0140-6736(96)03410-1

Wettlaufer, A., Cukier, S., Giesbrecht, N., & Greenfield, T. K. (2012). The marketing of responsible drinking: Competing voices of interests. Drug and Alcohol Review, 31, 231-239. doi: 10.1111/j.1465-3362.2011.00403.x

Wilkinson, C., Allsop, S., & Chikritzhs, T. (2011). Alcohol pouring practices among 65- 74-year-olds in Western Australia. Drug and Alcohol Review, 30, 200-206. doi: 10.1111/j.1465-3362.2010.00218.x

Chapter 5

University Students' beliefs about unit-based guidelines: A qualitative study

5.1. Abstract

UK government guidance for alcohol consumption is expressed in ‘units’ of alcohol. This study employed semi-structured interviews to explore university students’ knowledge of, attitudes towards, and use of unit-based guidelines. Thematic analysis revealed that participants were not motivated to adhere to unit-based guidelines and that they lacked the skills required to apply them to reduce their own drinking. Instead, interviewees used individual strategies to monitor their drinking. The results suggest that public health interventions should include provision of information, efforts to motivate young people to change their behaviour and strategies to develop skills for managing alcohol consumption.

5.2. Introduction

The health and social costs of alcohol are well documented (Balakrishnan et al., 2009; Scarborough et al., 2011). Although alcohol is part of the social lives of people of all ages, concern has often been focused on young adults - especially students in higher education. Recent statistics show that in the UK, young drinkers are less likely (48%) to report drinking alcohol in the previous week than older adults (66%). However, young drinkers aged 16 to 24 are more likely than any other age group to drink more than the weekly recommended limit in one single occasion (ONS, 2016). This confirmed previous finding that young drinkers are more likely than older adults to engage in heavy episodic drinking, and many students in higher education drink above the recommended guidelines (ONS, 2015; Piacentini and Banister, 2008).

To encourage people to reduce their alcohol intake, the UK government introduced the "sensible drinking" message in 1995, accompanied by guidelines for alcohol consumption expressed in "units" of 10mL/8g of ethyl alcohol (Department of Health, 1995; NHS, 2015a). Current advice is that men should not regularly drink more than 4 units and women should not regularly exceed 3 units per day (Department of Health, 1995; NHS, 2015a). In addition, people should have at least two alcohol-free days a week. Although weekly unit intake is not part of the government guidelines, researchers often measure whether men and women exceed 21 and 14 units per week, respectively. (Batty et al., 2009). Binge drinking (or heavy episodic drinking) is often defined as drinking more than twice the daily recommended maximum in one day - i.e., eight or more units for men; six or more units for women (Herring et al., 2008). Although most developed countries have some version of a unit-based system, there is no international consensus on unit size or recommended daily or weekly intake maxima (Furtwaengler and de Visser, 2013).

5.2.1. Understanding use and non-use of government alcohol guidelines

The Information-Motivation-Behavioural Skills Model (IMB) (Fisher and Fisher, 1992) suggests that to initiate and maintain healthy behaviours, individuals must possess relevant information, ideally including explanations of techniques to apply. Possessing information is necessary, but people must also be motivated to change. The model argues that well-informed, well-motivated individuals must also possess the necessary behavioural skills to enact healthy behaviours. When applied to alcohol research, existing literature shows that if "sensible drinking" messages are to have a positive impact, then it is essential that people understand unit-based guidelines, feel motivated to adhere to them, and have the skills required to do so (de Visser, 2015).

Research has shown that although most drinkers are aware of unit-based guidelines, few have accurate knowledge of them, and even fewer apply them to their own alcohol consumption. This lack of knowledge results in people making inaccurate estimates of how much they drink (de Visser, 2015; de Visser and Birch, 2012; Gill and O'May, 2007a, 2007b; ONS, 2015). In drink-pouring studies, participants often pour more than one standard drink or unit, and inaccurately estimate the amount of alcohol in a self-defined "usual" drink (de Visser, 2015; Kerr et al., 2005; Wilkinson et al., 2011). Furthermore, many young people do not perceive unit-based guidelines to be useful and are not motivated to adhere to them (de Visser and Birch, 2012; White et al., 2005).

Government guidelines have been derived with a predominantly health-focused message (Room and Rehm, 2012; Stockwell et al., 2012). This approach might not be the most effective for motivating young people, who tend not to be worried about health or consider their own alcohol intake to be harmful or dangerous (de Visser et al., 2013; Harrison et al., 2011). Further research is needed to determine why young people lack the knowledge, motivation, ad skills required to use unit-based guidelines. Qualitative

methods are useful for examining what people think about health-related issues because they put the primary focus on people's knowledge and perceptions of unit-based guidelines, their motivation and capacity to adhere to them, and their experiences as drinkers. The aims of the study described here were to explore the knowledge of, attitudes toward, and use of unit-based guidelines among university students.

5.3. Methods

5.3.1. Participants and procedure

The data presented here come from a mixed-methods study of university students in South-East England granted ethical approval by the host institution. The first phase of the study was a quantitative survey of alcohol use and knowledge of unit-based guidelines (614 students aged 18-30; 415 women and 199 men). Survey participants indicated whether they would be willing to be interviewed on topics covered in the questionnaire. Interested participants were invited by email and offered remuneration of either £5 or research participation credits. Interviewees gave written informed consent before being interviewed. Twelve semi-structured interviews were carried out with 8 women and 4 men aged 19-28. Interviews were conducted by the first author on the university campus. They commenced with an exploration of students' motives for drinking and not drinking, and then explored participants' knowledge of, attitudes toward, and use of unit-based guidelines. Interviewees also described approaches that they felt could improve and/or replace unit-based guidelines. Recordings of interviews were transcribed verbatim, and all identifiers were replaced with pseudonyms.

5.3.2. Thematic Analysis

Analyses employed an interpretative approach modelled on the procedures used in Interpretative Phenomenological Analysis (IPA: Smith et al., 2009) which prioritises

how individuals make sense of their experiences. The first author read the first interview and noted any observations, reflections and thoughts. The initial interview was re-read several times, and emergent themes were identified. These themes were organised in "clusters" in a table with quotations from the interview. A table of themes including quotations from the participants was created for each interview was constructed and is available on request. The same process was applied for the 11 remaining interviews, and new themes were added to those identified in earlier data. For the first two interviews, both authors independently coded the transcripts and agreed on an analytic plan. At all stages, the analyses conducted by the first author were discussed with the second author to ensure a consistent, consensual approach to analyses and interpretations. A summary table including themes and quotations from all interviews. The results are presented under seven headings representing the major themes to emerge from the analyses.

5.4. Results

5.4.1 Positive aspects of drinking

The most common reason interviewees gave for drinking was having fun and socialising with their friends. Many said that they like drinking because it helps lower their inhibitions and provides a confidence boost when meeting new people. Participants also mentioned that drinking alcohol helped them forget about their problems:

> Belinda: If you're going out then you can forget about all that week, deadlines, and just enjoy seeing your friends and just having a joke

Participants also found the effects of alcohol on their or their friends' behaviour entertaining and liked that when drinking, the unexpected could happen. They said that this aspect of drinking in excess was exciting and part of the fun when drinking and socialising:

Chris: Strange things happen on a night out that wouldn't happen if you were sober, like people just being ridiculous and entertaining

5.4.2. Negative aspects of drinking

All participants expressed a dislike of hangovers. Without exception it was the first thing they spontaneously reported as the main negative consequence of drinking alcohol. In addition to the physical side of the hangover, such as feeling sick and tired, the fact that it would take time the following day to recover was also mentioned, because it would make it difficult for them to fulfil work or study commitments:

Amy: Not being able to do the work I need to do. I hate feeling like that. I can't get away with being like that anymore, 'cause I've got more stuff to do

The majority thought that alcohol could have a negative impact on their general health, and some mentioned conditions such as cirrhosis. In addition, many thought that their brain could be damaged: blackouts and memory loss were considered negative aspects of heavy drinking. Although the risk of alcohol dependence was noted by some participants, none deemed their alcohol consumption problematic. A few admitted that although they might drink excessively at times, because of their young age, they were not concerned about their long-term health:

Chris: I just hope that because I am young that at this stage it doesn't really matter, whereas it will matter more in the future. Like I wouldn't want to drink as much. If I drank as I did when I was 30 as I do now, I'd feel like something was wrong

Interviewees noted that having fewer responsibilities and enjoying the freedom of a student lifestyle helped explain why they could drink more than other young people. They tended to feel that even if they were currently drinking more than they should, when they left university, their alcohol intake would reduce (e.g., "I think that after uni

when I am a little bit older, I'd like to think that I'll drink a lot less", Dina.)

Some participants – predominantly, but not only, women - said that they were aware of the high calorie content of alcoholic beverages and were concerned about gaining weight by drinking too much (e.g., "I don't want to end up drinking loads and putting on weight", Amy). On some occasions, participants tried to be healthier by drinking less alcohol, but they admitted that it was hard to find the right balance between enjoying drinking and having fun, and simultaneously adopting a healthier lifestyle:

> Amy: "I have been trying to drink a bit less and be healthier and stuff, but obviously at the same time it's something that I enjoy, and I feel I have to get that balance between being healthy and also enjoying your life

Participants also expressed concern about the negative impact of excessive alcohol consumption on people's behaviour. Interviewees noted that they disliked the fact that they or their friends could become an annoyance to others, and potentially ruin everybody else's night out. They also noted that they could hurt themselves or others by putting themselves in dangerous or vulnerable situations, or embarrass themselves by saying or doing things that they would later regret:

> Dina: If other people get too drunk, then they'll ruin the night 'cause they'll get kicked out or they'll be throwing up. So I think that's a bad thing when some people don't quite know, realise how much they are drinking and pass their boundaries

5.4.3. Attitudes towards unit-based guidelines

No participants felt that they were sufficiently knowledgeable about the government's unit-based alcohol consumption guidelines, even if they initially declared some familiarity:

> Dina: I feel like I am really familiar with them because I know I've heard them so

many times, but at the same time I am not even sure what they are, so I am definitely not. It's really weird. I feel like I should know, but I don't

This lack of familiarity was reflected by a lack of knowledge of exactly what those guidelines were. The majority reported knowing the daily recommended maxima for men and women. However, participants had no motivation to adhere to the guidelines. Interviewees felt unable to relate the unit-based guidelines to their patterns of alcohol use. They did not feel concern about how much they were drinking at the moment, and they did not feel it would be possible to achieve their goal of getting drunk on a night out while drinking within the guidelines:

Eric: The thing is you can drink within the recommended daily amount of units, but you don't get drunk on that. So socially it's almost a wasted enterprise, because if you're out to get drunk with your friends it's not much sense in just drinking a bit.

Some participants said that the likelihood of them adhering to the guidelines depended on their state of mind and the specific social context. When they were having a "quiet one" and not aiming at getting drunk, they felt it was not difficult to stay within the recommended guidelines:

Amy: Obviously if you are having a quiet one then it's probably easier not to, but I think if you're going to a party then it's quite easy to get carried away

In addition to finding it hard to adhere to the guidelines, none of the participants showed motivation to adhere to the guidelines, and they felt that only very conscientious young people would deliberately try to drink within the daily intake limits:

Dina: I don't think any young person is really going to - well unless they are really good - are going to adhere to them ... it's just something that people don't think about. I think a lot of young people drink in that kind of situation because it is one

> of the main things that we can do to have fun now, and I think that with the guidelines they'll get ignored because “I want to have fun!” overrides the guidelines

The only aspect of the recommendations that all participants agreed with was having at least two alcohol-free days a week. However, they felt that this was something that most students did anyway. Participants reported concentrating all of their drinking into one or two days, and did not drink at all on the other days of the week. In their eyes it was very important to give their “liver a break” from alcohol, and essential to give their body time to recover from any excess:

> Dina: Having the 2 days which doesn't actually seem, to be honest, too much. I know that most people I know and myself have at least 2 days when we won't be drinking. So yeah, I think that's quite a good recommendation.

5.4.4. (Non-)use of unit-based guidelines

Participants stated that they never use the alcohol units system to monitor their alcohol intake while drinking. For example, Frank explained that his own personal definition of excessive intake does not contain any reference to units:

> Frank: I am not doing the maths when I am having the drink. It's something I'd probably be much more aware of if I knew I was having a pattern of excessive, or what I view as excessive drinking continuously

The other main reason for not using the guidelines was the lack of understanding. Most interviewees found it hard to work out how many units are in a drink. They said that the whole process was too complicated and too difficult to remember. It was a recurrent complaint that the unit-based system was too abstract, and that they did not know, or could not remember, how many units were in the drinks they like to consume:

Grace: I find it quite hard to translate drinks to units. I kind of have looked into it and I always forget

Frank: I find the unit measurement actually quite cumbersome to work with in terms of judging what I am drinking

Most interviewees said that they had learnt about alcohol units at school or university. Many had also found information online on different websites, including that of the National Health Service. Half said that although they noticed the reports of units on bottle labels, they did not find the information useful in helping them to understand units, and that it did not motivate them to use the guidelines to monitor their alcohol consumption:

Helena: I guess you read it on the bottle if you are interested. It's kind of interesting, but it doesn't mean anything to me.

5.4.5. Individual strategies to manage alcohol intake

Most participants stated that when they wanted to keep track of their alcohol intake, they would use strategies other than counting units. Interviewees reported that their most commonly used strategy for controlling alcohol intake was to "pay attention to how you feel". They stated that it was more relevant to them to stop drinking when they felt that they had enough to drink and based this decision on their own personal experience. All participants said they would slow down or stop drinking when they reached their own personal limit - as indicated by feeling too drunk, slurring their speech, or feeling like they could be sick. This was combined with the majority explaining that, based on their own experience and tolerance of alcohol, they knew how much they could handle:

Dina: It is usually when I feel like I am already quite drunk. So if I feel like if I have anything else then it might tip me over the edge of feeling sick, then I won't drink

anything else.

The notion of being in control and knowing one's own limits was apparent when participants explained that they liked to drink certain types of alcohol because they had gained a good knowledge of how it would affect them, and how much of it they could handle. Such strategies to control alcohol intake reflected most interviewees' belief that they were experts on how much and what they can drink, and their unwillingness to adhere to an externally-imposed limit perceived as irrelevant to them.

The second most popular strategy used instead of counting units was to count how many drinks had been consumed. Most participants were aware that it might not be the most accurate way to estimate how much alcohol they had, but they found this method easier than calculating the unit content of drinks - especially on a night out when they wanted to have fun. Participants suggested that this was easier than adding non-integer numbers of units:

Frank: I don't think a lot of people use units as a way of measuring their drinking. I think a lot of people work on a much more generic "I've had a drink", which is really inaccurate and invites all sort of personal bias into kind of judging what that drink is.

5.4.6. Ideas for more effective health promotion messages

Given that participants did not use or intend to use the alcohol units system, it was important to examine their opinions about what would be a more effective approach to encourage and help young people to monitor their alcohol consumption. Most participants were initially unsure about how to address it. A few even said that finding an effective message would be impossible, mainly because they were not at all motivated to limit their alcohol intake, and felt that no people of their age would be

either. Some participants argued that health promotion messages are irrelevant, as one should be able to use one's common sense (e.g., "It's common sense if you've had too much you've had too much", Chris) and that how much one wants to drink should be a personal decision (e.g., "It's your personal opinion of how much you want to drink and how drunk you want to get"; Frank).

Despite their negative views of current unit-based guidelines, most interviewees said that they should be kept the same. Their main argument was that this system must have been set based on research and therefore should not be modified. One participant even said that it was good to have the guidelines even if they are ignored. A minority said that the unit limits should be increased so that it would be easier to adhere to them.

Most interviewees felt that campaigns should focus more on the negative consequences of excessive alcohol consumption, and should emphasise how alcohol affects the body, using tactics similar to those used to combat smoking. Participants also suggested that health promotion should focus more on messages that young people could relate to, such as stories of other young people who had experienced alcohol-related harm:

> Dina: Maybe more personalised testimonies from young people where it has affected them might be impactful 'cause it would be coming from a young person themselves who had to deal with the consequences of drinking too much.

Given the common view that the current system is too difficult to work with, one suggested solution was to standardize serving sizes of drinks (e.g., all servings of beer should be one unit). Another suggestion was to display in bars and pubs pictures of drinks that clearly show the unit content of each drink as a way of reminding people of the unit content of each drink that they may order:

> Kate: If you are just giving people numbers, people don't listen to numbers. They need pictures of exactly what you are drinking and how much that is. I think people need to know exactly of what a bottle of this and how much you can have

of it ... People aren't going to sit there and look at the numbers and work it out. Then you've got something to refer to if you're like sitting in a pub drinking with your mates and then you start to think about it no one in that state of mind is going to think about numbers.

One interviewee suggested that people could use portable electronic units calculators - perhaps in the form of a smart phone application to calculate how many units they had consumed (e.g., NHS, 2015b). At a broader level, half of the sample said that it was important to tackle Britain's drinking culture, because they thought it was socially accepted for people to drink excessively. One way to do that would be to promote alcohol-free activities and different ways to socialise:

Frank: In the UK it's really hard to find non-alcohol environments if you want to go out. So in Canada all the coffee shops stay open quite late. There have been times when I've gone out to meet friends thinking “I don't really fancy having a drink tonight”, and have paid the same for an orange juice and lemonade that they have paid for their pint and you're a bit like “I've been scammed really here”.

Although the majority of the sample reported counting drinks rather than units, only two suggested that this approach should replace the unit system. However, these participants said that they would pay more attention to such a system, and that it would make it easier if the unit-based system were converted to numbers of drinks allowed per day or per week:

Eric: I think that would be much better… for example 2 lagers and 1 shot tonight or something like that, or 2 lagers and a glass of wine… I think it would be much more useful to the average person.

Other participants said that the system should be age–related, allowing younger adults to drink more than older people. The stated rationale was that participants thought

that because of their younger age, their bodies were able to handle more alcohol and recover faster than older people:

> Chris: If they were less units for older people then maybe we'd understand 'cause it has more impact on their health and they can get worse hangovers.

Interviewees suggested that non-health-related factors such as showing people how embarrassing they were when drunk or focusing more on the cosmetic side of drinking (e.g., bad skin, gaining weight) would resonate more with young people. They said it would be more motivating as this population is sensitive to being perceived in a negative way and is concerned about appearance:

> Helena: maybe emphasise that it will make you look old and things like that, 'cause I think people care a lot more about looking bad than they do about liver disease.

Participants suggested that alcohol availability should be more regulated, either by banning advertising – as is the case for tobacco products, banning cheap- or free-drink offers, or restricting times when people can buy alcohol. The existing numbers of deals on alcohol and the 24 hours access to alcohol were seen as factors encouraging people to drink more:

> John: It's gotten worst because people can just buy alcohol whenever they want and you have all those happy hours and stuff or like drinks promotions … it's very much an English thing.

5.4.7. Financial constraints

Financial resources seemed to have an impact on how much people were prepared to spend on alcohol. Some participants said that, in order to save money, they would drink less alcohol or stick to less expensive soft drinks. A few said that when they have

more money or take their bank card with them on a night out then they would be more likely to buy more drinks (e.g., “That night I took my card, which is always very stupid, and I was buying drinks”, Amy).

Interviewees had mixed feelings about introducing minimum unit pricing for alcohol – a policy whereby alcohol could not be sold more cheaply than at a minimum price per unit of alcohol, and which could result in price rises for some products - and expressed some ambivalence towards the possible outcomes for them. Some thought it was a bad idea and that it would not help reduce people's alcohol intake. They thought that most people would keep drinking, but it would just cost them more money:

> Dina: it's just causing people to have a more monetary loss. It's not actually stopping people drinking at all. People are still going to want to drink and they are still going to want to get drunk ... I think I've heard somewhere that the UK has a bigger drinking problem than a lot of other European countries and when you go to a lot of European countries the alcohol is really cheap over there.

Although most interviewees thought that introducing minimum unit pricing would be a good idea, they expressed ambivalence. On one hand, they thought it could help cut people's drinking. On the other hand, they disliked it because it would be more expensive for them to buy alcohol and they were not necessarily willing to decrease how much they drink themselves:

> Grace: That sounds good ... not really, ’cause then I'll have to spend lot of money. I don't know ... I think it's a different kind of culture goes along with different drinks ... and I think it's unfair to kind of penalise everyone by raising the prices of everything rather than the people that drink less responsibly.

Most interviewees also thought that minimum unit pricing would be detrimental to people's health as, in their opinion, it would encourage them to use of other drugs instead of alcohol, which could have a worse impact on drinkers' health:

Chris: Maybe people would be more likely to take drugs if they couldn't afford alcohol and drugs weren't a much different price.

5.5. Discussion

The results presented above show that participants did not feel familiar with the government's unit-based guidelines. Although they were aware of their existence and knew where to find more information about them (e.g., online, on campus, etc.), most were unable to accurately remember and quote them. This lack of knowledge of the guidelines is in line with previous research (de Visser, 2015; Gill and O'May, 2007a, 2007b). So too was the observation that students did not always use this system or feel particularly motivated to use it to monitor and regulate their alcohol consumption (de Visser, 2015, de Visser and Birch, 2012; Lovatt et al., 2015). They thought the system was not very clear and was difficult to understand.

Participants expressed very low motivation to adhere to the unit-based guidelines. They felt that it was even more difficult in certain situations where their alcohol intake would be determined by enhancement motives such as drinking to have fun and to get drunk (Kuntsche and Cooper, 2010; Lovatt et al., 2015). Alcohol would then be consumed for its psychoactive properties but also because it was directly linked to what participants perceived as positive outcomes. These included the social aspects of drinking with peers, lower inhibitions and greater self-confidence. Alcohol was also used for coping motives such as forgetting about one's problems (Kuntsche and Cooper, 2010; Seaman and Ikegwuonu, 2010). Participants felt that it was when drinking to get drunk that it was particularly difficult to adhere to the guidelines. They perceived too a lack of social activities that did not involve alcohol.

No participants were worried about how much they drank, or the possible negative

consequences for their health. As observed in previous research, participants did not consider their drinking to be problematic (de Visser et al., 2013; Harrison et al., 2011). Therefore, even when acknowledging that their drinking might be heavier than that of the general population, participants considered their alcohol consumption well within the norm in a student population where regularly drinking in excess was seen as a transitory lifestyle phase. Interviewees expressed more concern about the negative social consequences such as embarrassing or antisocial behaviour.

Analyses showed that interviewees wanted to be considered as "expert" in relation to their own drinking. They felt that they were the ones who should decide how often and how much they should drink. They all expressed the idea of having a "personal limit" or a personal "alcohol tolerance" based on their previous experience as drinkers, and not defined in terms of units (Lovatt et al., 2015). They would know from experience what to do to avoid going over that limit. It was important to them to still have fun and not completely lose control of their behaviours. This dimension of control can be compared to the concept of "calculated hedonism" where drinking is a form of planned letting go where young people are choosing when, where and who to drink with but also when they can drink or not drink to excess (Brain, 2000; Szmigin et al., 2008)

When asked about ideas for future public health measures, many thought that the emphasis should be put even more on the possible negative effect of excessive alcohol consumption on one's health, but to use means other than unit-based guidelines to do so. However, research suggests that approaches that only focus on health-related consequences of excessive drinking are not very appealing or successful among young people (de Visser et al., 2013; Harrison et al., 2011; Lovatt et al., 2015). Contextual variables (e.g., having commitments the next day) and financial constraints seemed to have more influence on how little or how much people would drink. Opinion was divided about the introduction of a minimum unit price policy. Although participants

recognised the need for action to curb excessive alcohol consumption, such a measure was seen as unfair. As in other research, it was felt that it would disproportionately affect disadvantaged groups and punish sensible drinkers (Lonsdale et al., 2012), even if this would not actually occur under a MUP system.

Although this study has provided some important insights into young people's knowledge, motivation, and skills related to unit-based alcohol consumption guidelines, it does have some limitations. One limitation of the study was the relatively small sample composed of University students only. Furthermore, the sample was self-selected from participants who took part in the first phase of the study. Self selection is common in qualitative methodologies, and may mean that the results are not necessarily representative of a broader population. It would be good in future research to examine similar issues among other non-student people and among older adults. However, the aim of this study was to complement existing data from the quantitative phase of the mixed-methods design (Furtwängler & de Visser, 2016) showing low knowledge, motivation and skills among young people.

The data presented here indicate that current unit-based guidelines for the general population may not be perceived as appropriate by younger drinkers. It should be noted that the UK government is currently reviewing its guidelines; it will be important to ensure that these include lay understanding of risk (Lovatt et al., 2015). The IMB model suggests that individuals need to be well-informed, motivated to act, and must possess the relevant behavioural skills to experience positive health outcomes (Fisher and Fisher, 1992). However, this study shows that although young adults have access to information about unit-based guidelines for sensible drinking, they find the system difficult to understand, they may not be motivated to adhere to guidelines based on a health-focused message and they often do not possess adequate skills to apply them to their own drinking. This lack of skills related mainly to interviewees not feeling

confident estimating how many units were in their drink of choice. Recent research has shown that a drink-pouring exercise combined with personalized feedback may improve people's knowledge of and adherence to low risk drinking guidelines (de Visser, 2015). However, the results of this study and others' research suggests that there is a need for multifaceted public health interventions that focus not only on units, but also on other factors found to influence young people's alcohol use.

5.6. References

Balakrishnan R, Allender F, Scarborough P, Webster, P and Rayner, M (2009) The burden of alcohol-related ill health in the United Kingdom. *Journal of Public Health* 31(3): 366-373.

Batty DG, Lewars H, Emslie C, Gale C and Hunt C (2009) Internationally recognized guidelines for "sensible" alcohol consumption: is exceeding them actually detrimental to health and social circumstances? *Journal of Public Health* 31(3): 360-365.

Brain K (2000) *Youth, alcohol, and the emergence of the post-modern alcohol order*. Report, Institute of Alcohol Studies, UK.

Department of Health (1995), 'Sensible Drinking – The report of an Inter-Departmental Working Group', London: Department of Health.

de Visser R (2015) Personalized Feedback Based on a Drink-Pouring Exercise May Improve Knowledge of, and Adherence to, Government Guidelines for Alcohol Consumption. *Alcoholism: Clinical and Experimental Research* 39(2): 317-323.

de Visser RO and Birch JD (2012) My cup runneth over: Young people's lack of knowledge of low-risk drinking guidelines. *Drug and Alcohol Review* 31(2): 206-212.

de Visser, RO, Wheeler Z, Abraham C and Smith JA (2013) 'Drinking is our modern way of bonding': young people's beliefs about interventions to encourage moderate drinking. *Psychology and Health* 28(12): 1460-1480.

Fisher JD and Fisher WA (1992) Changing AIDS-risk behavior. *Psychological Bulletin* 11(3): 455-474.

Furtwængler NA and de Visser RO (2013) Lack of international consensus in low

risk drinking guidelines. *Drug and Alcohol Review* 32(1): 11-18.

Gill J and O'May F (2007a) Practical demonstration of personal daily consumption limits: a useful intervention tool to promote responsible drinking among UK adults? Alcohol and Alcoholism 42(5): 436-444.

Gill J and O'May F (2007b) How 'sensible' is the UK Sensible Drinking message? Preliminary findings amongst newly matriculated female university students in Scotland. J*ournal of Public Health* 29(1): 13-16.

Harrison L, Kelly P, Lindsay J, Advocat J and Hickey C (2011) 'I don't know anyone that has two drinks a day': Young people, alcohol and the government of pleasure. *Health, Risk and Society* 13(5): 469–486.

Herring R, Berridge V and Thom B (2008) Binge drinking: an exploration of a confused concept. *Journal of Epidemiology and Community Health* 62(6): 476-479.

Kerr WC and Stockwell T (2012) Understanding standard drinks and drinking guidelines. *Drug and Alcohol Review* 31(2): 200–205.

Kuntsche E and Cooper L (2010) Drinking to have fun and to get drunk: Motives as predictors of weekend drinking over and above usual drinking habits. *Drug and Alcohol Dependence* 110(3): 259–262.

Lonsdale A, Hardcastle SJ and Hagger MS (2012) A minimum price per unit of alcohol: A focus group study to investigate public opinion concerning UK government proposals to introduce new price controls to curb alcohol consumption. BMC Public Health 12(1): 1023.

Lovatt, M., Eadie, D., Meier, P.S., Li, J., Bauld, L., Hastings, G. and Holmes, J. (2015). Lay epidemiology and the interpretation of low risk drinking guidelines by adults in the United Kingdom, *Addiction*,

doi: 10.1111/add.13072.

NHS (2015a) Alcohol units - Live Well - NHS Choices. Available from: http://www.nhs.uk/Livewell/alcohol/Pages/alcohol-units.aspx (accessed 15 June 2015).

NHS (2015b) Track your drinks with our free smartphone app | Change4Life. Available from: http://www.nhs.uk/Change4Life/Pages/drinks-tracker-mobile-app.aspx (accessed 15 June 2015).

Office for National Statistics (2015) Adult Drinking Habits in Great Britain, 2013. Available at: http://www.ons.gov.uk/ons/rel/ghs/opinions-and-lifestyle-survey/adult-drinking-habits-in-great-britain--2013/stb-drinking-2013.html (accessed 07 June 2015).

Piacentini MG and Banister EN (2008) Managing anti-consumption in an excessive drinking culture. *Journal of Business Research* 62(2): 279-288.

Room R and Rehm J (2012) Clear criteria based on absolute risk: reforming the basis of guidelines on low-risk drinking. *Drug & Alcohol Review* 31*:* 135-140.

Scarborough P, Bhatnagar P, Wickramasinghe KK, Allender S, Foster C and Rayner M (2011) The economic burden of ill health due to diet, physical inactivity, smoking, alcohol and obesity in the UK. *Journal of Public Health* 33(4): 527-535.

Seaman P and Ikegwuonu T (2010) Drinking to belong: Understanding young adult alcohol use within social networks. Report, Joseph Rowntree Foundation, York.

Smith JA, Flowers P and Larkin M (2009) *Interpretative Phenomenological Analysis: Theory, Method and Research*. London: Sage.

Stockwell T, Butt P, Beirness D, Gliksman L and Paradis C (2012) The basis for Canada's new low-risk drinking guidelines: a relative risk approach to estimating hazardous levels and patterns of alcohol use. *Drug & Alcohol Review* 31*:* 126-134.

Szmigin I, Griffin C, Mistral W, Bengry-Howell A, Weale L and Hackley C (2008) Re-framing “binge drinking” as calculated hedonism: empirical evidence from the UK. *International Journal of Drug Policy* 19(5): 359-366.

White AM, Kraus CL, Flom JD, Kestenbaum LA, Mitchell JR, Shah K, Swartzwelder HS (2005) College students lack knowledge of standard drink volumes: implications for definitions of risky drinking based on survey data. *Alcoholism: Clinical & Experimental Research* 29(4): 631-638.

Wilkinson C, Allsop S and Chikritzhs T (2011) Alcohol pouring practices among 65- to 74-year-olds in Western Australia. *Drug and Alcohol Review* 30(2): 200–206.

Chapter 6

General discussion

This dissertation presented a programme of research based on three studies aiming at clarifying the concept of the 'sensible drinking' message and the development of the unit-based guidelines as an alcohol policy strategy to encourage people reduce their alcohol consumption. However, it has been shown that providing health recommendations is not always much of an incentive for people to adopt a healthier lifestyle, and create and sustain behaviour change. It is particularly true within an at-risk students population where regular heavy drinking is the norm. Even though in recent years there has been an increase of people abstaining from drinking alcohol - especially among young people in the UK and other countries – those who choose to drink still tend to drink above the recommended drinking guidelines (ONS, 2016, de Looze et al., 2015). The IMB model (Fisher & Fisher, 1992), which puts the focus on information, motivation and behavioural skills as key socio-cognitive factors in behaviour change, was used as a general theoretical framework. Determinants of motivation to adhere to the drinking guidelines and predictors of having the adequate skills to accurately estimate unit alcohol content of most recent drinking were identified. Finally, students' perception of such a measure and which role the drinking guidelines took or not in their experience as drinkers were explored. Despite some limitations, the results from the studies have important practical and theoretical implications, and findings from this research programme can be used in the development of future new drinking guidelines and to tailor more effective prevention strategies to curb excessive drinking among students in the UK and internationally.

6.1. Summary of main findings

6.1.1. Lack of cohesion and consensus of the concept of 'low-risk' drinking guidelines.

Study 1 reviewed the unit-based drinking guidelines of 57 countries. In relation to **research question 1** (what is the 'sensible drinking' message and how can it be defined?), analyses revealed a huge disparity in the alcohol content of a unit or a standard drink between countries, ranging from 8 to 14g of alcohol, and that there is no clear definition of the 'sensible drinking' message. No consensus exists about the threshold for low risk alcohol consumption on a daily or weekly basis, what the BAC should be for drivers and what the recommendations are for pregnant or breastfeeding women. This lack of consistency between national guidelines may make it difficult for individuals to develop and use skills to evaluate, monitor and regulate their own alcohol intake. It was suggested that a universal and global system of units and low risk drinking guidelines could help people to make better-informed and healthier choices about alcohol consumption. Based on the data, the following recommendations were made: a standard drink should contain 10g of ethanol, women should not drink more than 2 standard drinks per day and no more than 12 weekly, men should not exceed 3 standard drinks per day and no more than 18 weekly, and men and women should allow at least one alcohol-free day a week. Finally, motor vehicle drivers and pregnant/breastfeeding women should completely abstain from drinking alcohol.

6.1.2. Predictors of motivation and accuracy

In relation with **research question 2** (do young adults understand the unit-based guidelines and use them to monitor own drinking?), **research question 3** (what are the key determinants of motivation to adhere to unit-based guidelines?) and **research question 4** (what are the key determinants of being able to accurately estimate recent unit intake in students?), study 2 explored whether university students had the

knowledge, the motivation and the adequate skills to adhere to the government's unit-based guidelines. This study also aimed at identifying predictors of motivation (running multivariate linear regressions) and accuracy of estimates of unit content of recent drinking (running one-way ANOVA). The IMB model was used to frame the analyses. Results showed that for the 'information' component, participants had limited knowledge and understanding of the drinking guidelines with few able to accurately recall them, which was in line with existing research (de Visser, 2015). Similar to results found by Kerr and Stockwell (2012), 'motivation' to drink within these recommendations was low and greater motivation was linked to greater conscientiousness and greater perceived utility of the guidelines. People with higher motivation tend to drink less and report being drunk less frequently in the last month. Results focusing on the 'behavioural skill' component showed that, of the total sample, only 30% of the participants were able to accurately assess their alcohol intake in terms of units, and 35% underestimating and 34% overestimating their units intake. The only significant correlate of accuracy was the level of familiarity with the guidelines, with participants reporting higher levels of familiarity being more able to accurately estimate the unit content on their last drinking occasion. These results corroborated previous research that found people lacking the skills to estimate the alcohol content of a drink (de Visser & Birch, 2012; Kerr et al., 2005; Wilkinson et al., 2011). A recent study gave evidence that a drink-pouring exercise combined with personalized feedback could help improve people's knowledge of and adherence to low risk drinking guidelines (de Visser, 2015).

6.1.3. Students perception and beliefs about drinking guidelines

Study 3 focused on students' knowledge of the unit-based guidelines, their attitude toward them and the use and non-use of these guidelines to monitor own alcohol intake. In relation with **research question 2** (do young adults understand the unit-based

guidelines and use them to monitor own drinking?), results showed that knowledge about the guidelines was low and that there was a clear lack of motivation to adhere to them when drinking - especially when drinking motives were to have fun and intoxication - which was in line with existing research (de Visser, 2015; Gill & O'May, 2007a). Participants did not use the alcohol units system nor the guidelines to monitor their alcohol consumption, mainly because they found this system difficult to understand and use, and did not consider their own alcohol consumption to be problematic or a source of concern. They felt that they were the ones who should decide how often and how much they should drink. They all expressed the idea of having a 'personal limit' or a personal 'alcohol tolerance' based on their previous experience as drinkers, and not defined in terms of units (Lovatt et al., 2015). To avoid going over that limit, they would develop personal strategies more relevant to them and their experience as drinkers than the drinking guidelines and the unit-based system (Zajdow & MacLean, 2014).

Interviewees showed ambivalence toward the implementation of policy measures to curb excessive drinking. On one hand they recognised the need for this kind of action to be developed but only as long as they did not feel coerced into making changes they did not want to make. For example, opinions were divided about the introduction of a minimum unit price policy. Although participants recognised that increase in the price of alcohol could be effective in reducing people's alcohol consumption, such a measure was unpopular. Participants felt that it would unfairly and disproportionately affect disadvantaged groups and punish sensible drinkers.

6.2. Strengths of the research programme

6.2.1. New recommendations for 'low-risk' drinking

Years ago, Turner (1990) reviewed 125 studies to identify the evidence which the recommendations of 'low-risk' drinking levels were based on. However, interpretation and comparison were complicated and difficult because of the absence of a clear definition of a standard drink and the variations of alcohol content between guidelines from different countries. Already then, the author suggested that developing a clear definition of the alcohol content of a standard drink would be beneficial and allow direct comparison between epidemiological studies. Study 1 provided a more recent review of international guidelines about 'low-risk' drinking and the varied levels of alcohol content of a standard drink. It showed that the goal of harmonising definitions of standard drinks and consumption guidelines has not been reached yet. In relation to **research question 1** (what is the 'sensible drinking' message and how can it be defined?) and based on the lack of a clear definition, it was decided to issue recommendations and guidelines based on the results of study 1. A new approach was used and the proposed new guidelines were based on the mean and median of published official and national guidelines. They were based on a consistent 1.5:1 male:female consumption ratio taking into account how men and women tend to react differently to alcohol, and on the assumption that people should not drink every day. Although, the guidelines provided were somewhat arbitrary, they included a middle ground between relative risk and no risk approaches and were thought to remove some confusions and inconsistencies in the existing range of arbitrary guidelines. It was thought that it would be a positive step toward giving clear information to drinkers and enabling them to develop the necessary skills to change their drinking behaviours.

6.2.2. New method to assess ability to estimate alcohol unit content

One of the key elements assessed in study 2 was whether students were motivated to adhere to the unit-based guidelines but also whether they had the adequate skills to do so. Students' ability to consume alcohol levels within the government's drinking guidelines heavily rely on whether or not they know how many units are in the alcoholic beverages they consume, which in return helps them accurately monitor what they drink.

In relation to **research question 4** (what are the key determinants of being able to accurately estimate recent unit intake ?) and in order to evaluate such skills a new method was created. To start with, participants were asked to answer the following question within the online survey - "Thinking about the most recent time you drank alcohol, what did you drink?" - and to describe as precisely as possible the type, brand and quantity of alcohol they had consumed on the most recent day on which they drank alcohol (e.g. two pints of Stella Artois, and a shot of Tequila). The following question asked them to give a numeral estimation of how many units of alcohol this represented. Participants' reports and descriptions of their alcohol intake were used by the researchers to calculate the actual number of units consumed. The actual number of units consumed determined by the researchers was then compared to the participants' estimate and to allow them to be categorised, as being accurate (if the estimate was within ± 10% of the actual figure), underestimates (if the estimate was > 10% less than actual intake), or overestimates (if the estimate was > 10% more than actual intake).

Only 30% of the respondents were able to give accurate unit estimates. Such results are good indicators that participants lack skills when it comes to use the alcohol unit system and that not many are able to use it to track and monitor what they drink. There is a need to develop interventions in order to improve these skills.

6.2.3. Use of the IMB model as a theoretical framework for behaviour change research on alcohol misuse

In relation to **research question 5** (can the IMB model be used as an effective theoretical framework to predict behaviour change for alcohol use?) it was shown that the IMB model is a validated behaviour change model that has been under used in predicting alcohol use change. To our knowledge, it has not been used to develop alcohol reduction strategies. Using the IMB model as a theoretical framework for this programme of research helped getting a better insight into students' understanding, and use or lack of use of the drinking guidelines. Identifying that knowledge and motivation were low and that there was a general lack of skills required to monitor unit intake among students provided support that measures putting the primary focus on improving students' knowledge and perceptions of the unit-based guidelines as well as their motivation to adhere to them and capacity to adhere to them could potentially be very effective. Indeed, putting the emphasis on developing skills to estimate the unit content of alcohol beverages and thus accurately monitor own unit intake could enable students to initiate and maintain healthier alcohol use behaviours.

6.3. Limitations

The main limitations of this research programme are that it focuses on a UK students population aged 18-30 years old only. Taking this into account makes the findings in this dissertation not necessarily representative of a broader population, such as non-student young adult and an adult population over 30 years of age. Furthermore, there was an over representation of female participants in study 2 and 3 and it could be beneficial to investigate further a higher representation of male students as it has been shown that young men are more prone to HED.

Although the qualitative study provided an in-depth insight into students' beliefs

and perception about the alcohol unit system, the size of the sample was fairly small, making the results difficult to generalise. It would be interesting to carry interviews on a larger scale. Another limitation of study 3 is that the sample was self-selected from participants who took part in the first phase of the study and indicated their interest in being interviewed for the second stage. With a non-random sample, the results may not be representative.

Because of the specificity of the UK drinking culture, these results may not apply to students in different countries. Future research could be carried in other countries around the world and explore students' beliefs and perception, and use or non-use of the countries' own drinking guidelines and alcohol reduction policy.

6.3.1. Reflexive account

A reflexive stand is the acknowledgement that as researchers, our cultural and historical background shape our knowledge and understanding of the world and the importance of taking into account how these factors might have an impact on the research experience, decisions and interpretations during the study of a topic (Mood, 2008).

I am originally from Switzerland and moved to the UK to start my PhD. On arrival, I was surprised by the unexpected amount of cultural differences that I noticed. One of the more salient difference I notices was how much people drank. When I first moved into my new house, it was my then housemate's birthday. Her friends and her went on to celebrate it for a whole week and drank large amount of alcohol every single day. I remember being shocked by how much alcohol they could drink. I also noticed that her and her girlfriends regularly drank to oblivion. Double standards exist of the perception of women drinking compared to men drinking. Excessive drinking is perceived to be more a masculine activity (de Visser & McDonnell, 2012) and it is particularly true

where I come from. I always felt that social expectations exist on how women should behave when drinking. They must remain in control of their behaviour and a very negative light is shed on women who drink at a level where they lose control of themselves (which is not considered as being feminine).

Another aspect that surprised me was the relatively permissive drinking norms at university and excessive drinking behaviours among students. I was surprised by the low numbers of teaching classes first year students had to attend and the amount of free time they dedicated to socialise, party and drink. On any day of the week, I had students attending the practicals and seminars while hungover. I felt that my own experience as an undergraduate was very different. I was in a very competitive and selective study programme where the emphasis was that, in order to academically be successful, students would have to focus on their studies. My social life definitely took a back seat during my undergraduate studies. Of course we had social events and did go out but with a busy class schedule, strict attendance policy, and the pressure from a competitive and selective environment, it was a rare occurrence to drink heavily during the week. It was also a rare opportunity to be able to go out and socialise more than once weekly.

I also come from a family circle where drinking is seen as something you do in moderation and usually at meal time for 'special occasions'. My dad never really enjoyed drinking and has been a teetotaller for almost all his life. My mum would buy a bottle of wine when we would have people around for dinner and the adults would enjoy one or two glasses of wine during the meal. Between these special occasions, no alcohol was stored in the house. The legal drinking age for beer and wine is 16 years old in Switzerland. However, my parents did not allow my sisters and I to drink alcohol with them until we were 18 years of age. Coming home drunk after a night out and being hungover the following day was frowned upon and I used to avoid being in that situation by drinking in moderation while I was still living at home. Even now that I am

living away from home, I would still consider myself as being a moderate drinker because I took a habit to be able to enjoy myself, party and socialise without the need to drink alcohol all together or drink in excess.

When my initial supervisor decided to take on a new position at a different university, I had to find another supervisor to work with and take on a new research project. I was instantly interested by the behaviour change study group and the mixed-methods research approach adopted by Dr. Richard de Visser, because my Masters degree was in health psychology and I have a keen interest in qualitative research. I did not know what the unit-based guidelines and the 'sensible drinking' message were because it is not an alcohol policy commonly used and advertised in Switzerland but I was interested in finding more about it. Because of my own initial observations of different drinking patterns than those I was used to and a different personal drinking background, I thought that it would be interesting to investigate a drinking culture that was new to me. When I learned more about the units of alcohol system and the unit-based guidelines my initial thought was that people I knew or observed around me were clearly not drinking within those guidelines and did not seem to be willing to do so. I thought it would be interesting to investigate the reasons behind why this alcohol policy seemed to lack the expected positive impact on young people's drinking and what kind of approach could potentially be more effective. My second thought was that unit alcohol system seemed to be fairly complicated to work out and that it would be interesting to explore how people use the unit-based guidelines to keep track of, and monitor their own drinking.

As I was reading more and more on the topic, I realised how varied the definitions of a standard drink and of safe levels of alcohol consumption differed from studies to studies. I also noticed that the guidelines varied between the UK and Switzerland and I wondered if it was a larger issue between countries. These questions resulted in the

development of study one and the review of the governments guidelines from 57 countries.

It was clear in my mind that a mixed-methods research programme was the best way to explore people's knowledge and attitude toward the guidelines and explore the reasons behind use and non-use of the guidelines. The fact that I wanted to apply and develop my skills in both quantitative and qualitative methods also played a role in the decision. I had not handled a very large data set before and was keen to do so and carrying an online survey seemed to be the best option in order to select a high number of participants.

From my perspective as a moderate drinker, I can spend weeks without feeling the need to drink and when I do so it is usually no more than once a week and rarely to an intoxication level. Most of the time, I drink within or below the government guidelines. The questions in the survey were based on my curiosity to find out how much people drink and how often, why they do not drink within the guidelines and why they enjoy drinking above them. Because I knew so little myself about the drinking guidelines, I wanted to explore people's knowledge and perception of them. Because I was never encouraged to use the Swiss government guidelines to monitor my own alcohol use, I wanted to ask questions about whether, from a drinker's perspective, this measure was easy to use, and useful or not in facilitating reduction in alcohol intake. Based on the results from the online survey that people did not perceive the guidelines to be useful, did not know much about them, did not use them, and lack the motivation and skills to drink within the recommended levels; qualitative research interviews were the ideal tool to use to have a more in-depth understanding of the participants' perspective and reasons behind these initial results. While conducting the interviews, it was difficult to keep my own experience as a moderate drinker, my cultural background and my personal choices to drink moderate levels of alcohol on the side. For example, I did find difficult at times

not to be judgemental about how much interviewees reported drinking, in particular women.

My personal history, choices, and cultural background have been instrumental in selecting the topic of this dissertation, the structure, design, and content of this research programme.

6.4. Implications for future research and behaviour change strategies

The results presented in this dissertation bring evidence that students lack knowledge of the unit-based guidelines, do not find them useful and show little interest in using them to monitor their alcohol consumption. Because of the high prevalence of excessive drinking among students, there is a need for multifaceted public health interventions that focus not only on units and health orientated message, but those elements reported by young people to have more influences on their alcohol use.

Some unexpected results appeared. In the quantitative phase, there were not enough significant differences (i.e., no differences in drinking patterns) between men and women to divide the data set which was surprising because ways men and women drink are thought to be different. In the survey study, familiarity with the guidelines was a predictor of the ability to accurately estimate alcohol unit content of a drink but not actual knowledge which was surprising because from the results of the qualitative study familiarity does not automatically result in a good knowledge about what the drinking guidelines are. During the qualitative interviews, participants felt confident that they were familiar with the guidelines, however few were able to accurately recollect them or knew what was the alcohol content of a unit of alcohol. This raises questions about how people can accurately estimate what they drink if they do not have the knowledge about what a unit of alcohol is. Knowledge was not a predictor of motivation to adhere to the guidelines either which was unexpected as it could be argued that a high level of

knowledge could increase people's confidence in their capacity to drink within the government guidelines which in return could have a positive impact on motivation.

In the qualitative study, participants reported never using the government's guidelines. However, it turned out that they all respected one recommendation. All participants said that they would have at least 2 alcohol-free days a week and sometimes even more. It was expected that when participants reported not using the government guidelines they would reject the whole message. It seems like they took on board only some parts of the sensible drinking message when it is something that they already implement and find easy to follow.

Interviewees lacked awareness about the possible short-term negative consequences of alcohol use and did not feel that drinking heavily could have any adverse impact at this stage of their life. Contextual variables such as having work to do or being on a budget were invoked as incentive to drink less but never health-related ones.

Because drinking patterns were shown to be correlated to motivation and accuracy, one research extension could explore this relationships further. A new survey study could screen participants for alcohol use and assign them in three groups depending on alcohol use: low, moderate and heavy drinkers. Comparison of descriptive statistics results across the three groups could further explore the strength of the relationship between drinking patterns, motivation to drink within the guidelines and the skills to do so.

For another research extension, the validity of the different components of the IMB model could be tested with a randomized control trial. All participants alcohol use would be assessed with a survey. Condition one could provide more information about what the guidelines and the concept of units are. The second condition could involve

one session of motivational interviewing (MI). The third condition could use the new accuracy task developed in the research programme, where participants would be asked to estimate their most recent alcohol unit intake and receive feedback on how accurate they were. The control group would not receive any behaviour change intervention. After a follow-up period, levels of alcohol use would be assessed across the four conditions to see if providing participants with more information, intervention to increase motivation and skills would effectively have a positive impact on their alcohol use.

6.5. Conclusion

There is still a lack of consensus about what levels of alcohol intake are considered to be 'low-risk' for one's health. Opinions from different research panels worldwide still varies which means that, to date, it is difficult to find a clear definition of the 'sensible drinking' message and that it is not possible to fully answer the first research question. As expressed in the report of study 1, achieving an international agreement and creating a universal unit-based system would provide better support to people trying to take an informed decisions about their alcohol consumption.

Our second research question was about young people's ability to understand and use the unit-based guidelines to monitor their own drinking. It was shown in this dissertation that these guidelines lack relevance for young adults and do not play an integral role in their experience as drinkers. We provided evidence that young people have their own strategies to monitor and control their own drinking and that they would rather use them than the units of alcohol system.

With our third and fourth research question, this programme of research identified correlates of motivation to adhere to the UK drinking guidelines and students' ability to accurately estimate recent unit intake. There was only one predictor of accuracy found

in study 2 and it was the level of familiarity with the guidelines. Many of our participants were unable to accurately recall how many units were recommended for men or women and did not know the alcohol content of one unit. Future health promotion campaigns should focus on that level of familiarity, because it is unrealistic to expect a health behaviour change measure to create behaviour change when people do not know what such measures consist of. Some of the determinants of motivation to drink within the drinking guidelines were how useful people found them and how often they used them. It can be hypothesised that working on a more positive image of the unit-based drinking guidelines (e.g., making them easier to use by standardising servings) could improve students' perception of them and in return improve frequency of use.

More research needs to be done in order to validate the IMB model to predict behaviour change for alcohol use but it was a useful theoretical framework to focus the analyses and highlight new elements explaining why the alcohol unit system has not reached its potential in creating sustainable alcohol behaviour change.

Based on the results presented here, it seems that students could benefit from interventions focusing on providing clear information about the 'low risk' drinking guidelines. All participants were aware of the existence of drinking guidelines but few were able to recollect them accurately. It seems that more information is needed and that it may be beneficial to make the current government's guidelines more accessible by promoting and making them more visible on campus. With the recent revision of the drinking guidelines in early 2016 (DoH, 2016), the UK government has a clear opportunity to advertise these new guidelines appropriately and increase people's awareness and knowledge of them.

Participants' lack of motivation to change their drinking behaviours seem to come,

to some extent, from the fact that they do not perceive their own alcohol consumption to be problematic which supports findings from a study from Gregory & Jones (2009). They think that regularly drinking in excess is only a transitory phase that do not have important short- or long-term negative consequences on their health. Strategy preventions could provide more information about the short-term negative consequences linked to heavy drinking and more evidence about the even more damaging effect of certain drinking patterns such as HED but also evidence that drinking patterns occurring at university could lead to problematic alcohol use later in life. Our results showed that participants perceived their risks for negative health outcome to be low. Several health behaviour change models (e.g., Becker, 1974) include an element of risk acknowledgement as a precursor to behavioural change and propose that before people take action to attenuate a health risk, they must first recognise the risks associated with their behaviour (Helweg-Larson & Nielsen, 2009). The addition in the new UK guidelines of the associated risk between different types of cancer and drinking alcohol is interesting (DoH, 2016). It could be interesting to evaluate if this addition increases personal risk perception among drinkers and encourage them to reduce their alcohol consumption.

Students' lack of skills to use the unit-based guidelines to monitor own alcohol consumption seem to stem from the fact that the units were perceived as difficult to translate into drinks and that they are not confident in estimating how many units are in their drink of choice. However, previous research found that many young people do not actually wish to drink to oblivion (Herring et al., 2014; Zajdow & MacLean, 2014) and that, when willing to control their own drinking, many have the ability to develop their own strategies and skills to limit or pace alcohol intake. Future research could explore and assess the efficacy of these personal strategies, such as taking a limited amount of money and no bank cards on a night out or counting drinks instead of units.

Finally, this dissertation brings evidence that depending on their beliefs and psychological traits, people will respond differently to health behaviour change strategies. Results suggest that more conscientious people would be more receptive to prevention message and that screening for and targeting of heavier drinkers could improve the effectiveness of public health interventions.

Chapter 7

References

Abel, E. L., & Hannigan, J. H. (1995). Maternal risk factors in fetal alcohol syndrome: provocative and permissive influences. *Neurotoxicology & Teratology, 17,* 445-62.

Alcohol Concern. (2015). Dry January. Retrieved from http://www.dryjanuary.org.uk/

Alcohol Minimum Pricing (Scotland) Act, 2012. Available at http://www.legislation.gov.uk/asp/2012/4/pdfs/asp_20120004_en.pdf

American College Health Association. (2010). National College Health Assessment. Available at: http://www.acha-ncha.org/docs/ACHA-NCHA-II_ReferenceGroup_ExecutiveSummary_Fall2010.pdf

Anderson, P., Amaral-Sabadini, M. B., Baumberg, B., Jarl, J., & Stuckler, D. (2011). Communicating alcohol narratives: creating a healthier relation with alcohol. *Journal of Health Communication*, *16*(S2), 27–36. DOI: 10.1080/10810730.2011.596609

Anderson. P., & Baumberg, B. (2006). *Alcohol in Europe. A public health perspective*. London, Institute of Alcohol Studies.

Anderson, P., Chisholm, D., & Fuhr, D. C. (2009). Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet, 373*, 2234–46. doi: 10.1016/S0140-6736(09)60744-3.

Atwell, K., Abraham, C., & Duka, T. A. (2011). A parsimonious integrative model of key psychological correlates of UK university students' alcohol consumption. *Alcohol and Alcoholism*, *46*, 253– 60. DOI: http://dx.doi.org/10.1093/alcalc/agr016

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision* Processes, *50*, 179–211. DOI: 10.1016/0749-

5978(91)90020-T

Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, *52*, 27–58. doi: 10.1146/annurev.psych.52.1.27

Ajzen, I., Albarracín, D., & Hornik, R. (Eds.) (2007). Prediction and change of health behavior: Applying the reasoned action approach. Mahwah, NJ: Lawrence Erlbaum Associates.

Arroll, M. A., & Senior, V. (2008). Individual's experience of chronic fatigue syndrome/myalgic encephalomyelitis: An interpretative phenomenological analysis. *Psychology and Health, 23*(4), 443–458. doi:10.1080/14768320701246469

Babor T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H., Homel, R., Livingston, M., Österberg, E., Rehm, J., Room, R., & Rossow, I.: *Alcohol: No Ordinary Commodity. Research and Public Policy*. 2nd Edition. Oxford and London: Oxford University Press; 2010.

Bachman, J., Wadsworth, K., O'Malley, P. M., Johnston, L. D., & Schulenberg, J. Smoking, Drinking, and Drug Use in Young Adulthood: The Impacts of New Freedoms and New Responsibilities. Mahwah, N.J. : L. Erlbaum Associates, 1997.

Balakrishnan, R., Allender, F., Scarborough, P., Webster, P. & Rayner, M. (2009). The burden of alcohol-related ill health in the United Kingdom. *Journal of Public Health, 31*(3), 366-373.

Barry, A. E., & Goodson, P. (2010). Use (and misuse) of the responsible drinking message in public health and alcohol advertising: A review. *Health Education & Behaviour, 37,* 288-303.

Batty, G. D., Hunt, K., Emslie, C., Lewars, H., & Gale, C. R. (2009) Alcohol problems and all-cause mortality in men and women: Predictive capacity of a clinical screening tool in a 21-year follow-up. *Journal of Psychosomatic Research*, 66, 317-21. doi: 10.1016/j.jpsychores.2008.09.021

Batty, D. G., Lewars, H., Emslie, C., Gale, C., & Hunt, C. (2009). Internationally recognized guidelines for "sensible" alcohol consumption: is exceeding them actually detrimental to health and social circumstances? Evidence from a population-based cohort study. Journal of Public Health, 31, 360-365. doi: 10.1093/pubmed/fdp063

Berg, C. J., Thomas, J. L., An, L. C., Guo, H., Collins, T., Okuyemi, K. S., & Ahluwalia, J. S. (2012). Change in smoking, diet, and walking for exercise in blacks. *Health Education and Behaviour,* 39, 191–197. doi: 10.1177/1090198111432252

Bewick, B. M., Mulhern, B., Barkham, M., Trusler, K., Hill, A. J., & Stiles, W. B. (2008). Changes in undergraduate students alcohol consumption as they progress through university. *BMC Public Health*, *8*(163). doi:10.1186/1471-2458-8-163

Bian. C., Xu, S., Wang, H., Li, N., Wu, J., et al. (2015). Correction: A Study on the Application of the Information-Motivation-Behavioural Skills (IMB) Model on Rational Drug Use Behaviour among Second-Level Hospital Outpatients in Anhui, China. *PLoS ONE* ,*10*(9): e0137928. doi: 10.1371/journal.pone.0135782

Black, N., & Mullan, B. (2015). An intervention to decrease heavy episodic drinking in college students: the effect of executive function training. *Journal of American College Health*, *63*(4), 280-4. doi: 10.1080/07448481.2014.990969

Borglin, G. (2015). Complex Interventions in Health: An overview of research methods., First edited by Richards D.A., Hallberg I.L (eds): chapter Chapter 3: pages 29-45; London: Routledge Taylor & Francis Group.

Bouchery, E. E., Harwood, H. J., Sacks, J. J., Simon, C. J., & Brewer, R. D. (2011). Economic costs of excessive alcohol consumption in the United States, 2006. *American Journal of Preventive Medicine*, *41*, 516–24. doi: 10.1016/j.amepre.2011.06.045

Bradby, H. (2007). 'Watch out for the aunties! Young British Asians' accounts of

identity and substance use'. *Sociology of Health and Illness*, *29*, 656–72.

Brain, K. (2000). *Youth, alcohol, and the emergence of the post-modern alcohol order*. Report, Institute of Alcohol Studies, UK.

Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.

Brennan, A., Purshouse, R., Taylor, K., & Rachid, R. (2008). Independent review of alcohol pricing and promotion: Part B. Modelling the potential impact of pricing and promotion policies for alcohol in England. Sheffield, UK: ScHARR University of Sheffield and Department of Health.

Brener, N. D., & Collins, J. L. (1998). Co-occurrence of health-risk behaviors among adolescents in the United States. *Journal of Adolescent Health*, *22*(3), 209–213. doi: 10.1016/S1054-139X(97)00161-4

Breslow, R. A., Chen, C. M., Graubard, B. I., & Mukamal, K. J. (2011). Prospective Study of Alcohol Consumption Quantity and Frequency and Cancer-Specific Mortality in the US Population. *American Journal of Epidemiology, 174,*1044-53.

Britton, A., & Marmot, M. (2004). Different measures of alcohol consumption and risk of coronary heart disease and all-cause mortality. *Addiction, 99,* 109-16.

Brocki, J. M., & Wearden, A. J. (2006). A critical evaluation of the use of interpretative

phenomenological analysis (IPA) in health psychology. *Psychology and Health 21,* 87-108.

Bryman, A. (2006)."Integrating Quantitative and Qualitative Research: How is it Done?". *Qualitative Research*, 6, 97-113.

Cabinet Office. (2004). *Alcohol Harm Reduction Strategy for England*. London: Prime Minister's Strategy Unit.

Campo, S., Brossard, D., Frazer, M. S., Marchell, T., Lewis, D., & Talbot, J. (2003). Are social norms campaigns really magic bullets? Assessing the effects of students' misperceptions on drinking behaviour. *Health Communication*, *15*,

481–497. doi:10.1207/S15327027HC1504_06

Chaloupka, F. J., Grossman, M., & Saffer, H. (2002). The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Research and Health, 26,* 22–34.

Chang, S. J., Choi, S., Kim, S., & Song, M. (2014) Intervention Strategies Based on Information-Motivation-Behavioral Skills Model for Health Behavior Change: A Systematic Review. *Asian Nursing Research*, *3*, 172–181. DOI: http://dx.doi.org/10.1016/j.anr.2014.08.002

Centre for Science in the Public Interest (CSPI). (2003). Petition to Improve Mandatory Label Information on Alcoholic Beverages. Available at: https://www.cspinet.org/booze/031216IngLabelingPetition.pdf (Retried 01 May 2016).

Colby, S. M., Colby, J. J., & Raymond, G. (2009). College versus the real world: student perceptions and implications for understanding heavy drinking among college students. *Addictive Behaviours*, *34*(1), 17-27. DOI: 10.1016/j.addbeh.2008.07.023

Conibear, H. (2011). Social aspects and communication regarding alcohol and health via national drinking guidelines. *Journal of Wine Research*, *22*(2), 187-193. doi:10.1080/09571264.2011.606014

Conroy, D., & de Visser, R. (2014). 'Man up!': discursive constructions of non-drinkers among UK undergraduates. *Journal of Health Psychology*, *18*(11), 1432-1444.

Cooke, R., Dahdah, M., Norman, P., & French, D. (2014). How well does the theory of planned behaviour predict alcohol consumption? A systematic review and meta-analysis. *Health Psychology Review*, 1-20. doi: 10.1080/17437199.2014.947547

Couper, M. P. (2000). Web surveys: a review of issues and approaches. *Public Opinion Quarterly, 64*(4), 464-494.

Corrao, G., Bagnardi, V., Zambon, A., & La Vecchia, C. (2004). A meta-analysis of alcohol consumption and the risk of 15 diseases, *Preventive Medicine, 38,* 613-9.

Corrao, G., Rubbiati, L., Bagnardi, V., Zambon, A., & Poikolainen, K. (2000). Alcohol and coronary heart disease: A meta-analysis. *Addiction, 95,*1505-23.

Craigs, C. L., Bewick, B. M., Gill, J., O'may, F., & Radley, D. (2012) UK student alcohol consumption: A cluster analysis of drinking behaviour typologies. Health Education Journal, 71, 516-526. doi: 10.1177/0017896911406967

Creswell, J. W. (2011). Controversies in mixed methods research. In Denzin, N. K. & Lincoln, Y. (Eds.), (2011). *The Sage Handbook of Qualitative Research* (4th ed., pp. 269-283). London: Sage.

Creswell, J. W., & Plano Clark V. *Designing And Conducting Mixed Methods Research*. Thousand Oaks, Calif.: SAGE Publications, 2007. Print.

Dawson, D. A. (2000). US low-risk drinking guidelines: examination of four alternatives. *Alcoholism: Clinical and Experimental Research, 24*(12), 1820–1829. doi: 10.1111/j.1530-0277.2000.tb01986.x

de Looze, M. D., Raaijmakers, Q., Bogt, T. T., Bendtsen, P., Farhat, T., Ferreira, M., Godeau, E., Kuntsche, E., Molcho, M., Pförtner, T.K., et al. (2015). Decreases in adolescent weekly alcohol use in Europe and north America: Evidence from 28 countries from 2002 to 2010. *European Journal of Public Health, 25, S*69–S72. doi: 10.1093/eurpub/ckv031

Del Boca, F. K., Darkes, J., Greenbaum, P.E., Goldman, M.S. (2004). Up close and personal: Temporal variability in the drinking of individual college students during their first year. *Journal of Consulting and Clinical Psychology, 72,* 155–164. doi: 10.1046/j.1359-6357.2003.00586.x

Denscombe, M. (2008). A research paradigm for the mixed methods approach. *Journal of Mixed Methods Research*, *2*, 270-283. doi:

10.1177/1558689808316807

Denzin, N. K., & Lincoln, Y. S. (2005). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), The sage handbook of qualitative research (2nd ed.). Thousand Oaks, CA: Sage.

Department of Health. (December 1995). 'Sensible Drinking – The report of an Inter-Departmental Working Group', DH, London, p. 24.

Department of Health. (2011). Public health responsibility deal: alcohol pledges. Available at: https://responsibilitydeal.dh.gov.uk/alcohol-pledges/ (retrieved 12 January 2016).

Department of Health (2016). UK Chief Medical Officers' Alcohol Guidelines Review. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/489795/summary.pdf (retrieved 13 January 2016).

Department of health and human services. (2015). Behavioural health trends in the United States: Results from the 2014 national survey on drug use and health. available at http://www.samhsa.gov/data/sites/default/files/NSDUH-FRR1-2014/NSDUH-FRR1-2014.pdf (Retrieved 13 January 2016).

de Visser, R. (2015). Personalized feedback based on a drink-pouring exercise may improve knowledge of, and adherence to, government guidelines for alcohol consumption. *Alcoholism, clinical and experimental research*, *39*, 317-323. doi: 10.1111/acer.12623

de Visser, R. O., & Birch, J. D. (2012). My cup runneth over: Young people's lack of knowledge of low-risk drinking guidelines. *Drug and Alcohol Review, 31*, 206-212. doi: 10.1111/j.1465-3362.2011.00371.x

de Visser, R. O., Hart, A., Abraham, C., Memon, A., Graber, R., & Scanlon, T. (2014) Which alcohol control policies do young people think are effective? Drug & Alcohol Review, *33*, 144-151. doi: 10.1111/dar.12109

de Visser, R. O., & McDonnell, E. J. (2012) 'That's OK He's a guy': a mixed-

methods study of gender double-standards for alcohol use. *Psychology & Health,* 2012; *26,* 618–39. doi: 10.1080/08870446.2011.617444.

de Visser , R. O., & Smith, J. A. (2007). Young men's ambivalence toward alcohol. *Social Science and Medicine, 64,* 350-62.

de Visser, R. O., Wheeler, Z., Abraham, C., & Smith, J. A. (2013). 'Drinking is our modern way of bonding': young people's beliefs about interventions to encourage moderate drinking. *Psychology and Health, 28*(12), 1460-1480.

Devos-Comby, L., & Lange, J. E. (2008). "My drink is larger than yours"? A literature review of self-defined drink sizes and standard drinks. *Current Drug Abuse Reviews,* 1, 162-76.

Di Castelnuovo, A., Costanzo, S., Bagnardi, V., Donat, M. B., Lacoviello, L., & de Gaetano, G. (2006). Alcohol dosing and total mortality in men and women: An updated meta-analysis of 34 prospective studies. *Archives of Internal Medicine, 166,* 2437-45.

Dodd, L. J., Al-Nakeeb, Y., Nevill, A., & Forshaw, M. J. (2010). Life risk factors of students: A cluster analytical approach. *Preventive Medicine*, *51*,73–77. doi: 10.1016/j.ypmed.2010.04.005

Donaldson L. (2009). Guidance on the consumption of alcohol by children and young people. Retrieved from http://www.dh.gov. uk/prod_consum_dh/groups/dh_digitalassets#/documents/ digitalasset/dh_110256.pdf.

Donaldson, L. J., & Rutter, P. D. (2011). Commentary on Black et al. (2011): Minimum pricing of alcohol - a solution whose time has come. *Addiction*, *106,* 737–738. doi: 10.1111/j.1360-0443.2011.03370.x

Dufour, M. C. (1999). What is moderate drinking? Defining drinks and drinking levels. *Alcohol Research & Health, 23,* 5-14.

Dures, E., Rumsey, N., Morris, M. and Gleeson, K. (2011). Mixed methods in health psychology: theoretical and practical considerations of the third paradigm. *Journal of Health Psychology*, 16 (2). pp. 322-341.

Elder, J. P. (2001). Behaviour Change and Public Health in the Developing World. Sage, London.

Elder, R. W., Lawrence, B., Ferguson, A., Naimi, T. S., Brewer, R. D., Chattopadhyay, S. K., Toomey, T. L., & Fielding, J. E. (2010). The Effectiveness of Tax Policy Interventions for Reducing Excessive Alcohol Consumption and Related Harms. *American Journal of Preventive Medicine*, *38*(2), 217–229. doi: http://doi.org/10.1016/j.amepre.2009.11.005

European Alcohol Policy Alliance (Eurocare). (2012). Eurocare recommendations for a future EU Alcohol Strategy. Available at: http://www.eurocare.org/library/updates/eurocare_eu_alcohol_strategy2 (Retrieved 01 May 2016).

Foundation for Alcohol Research & Education. (2015). Understanding recent trends in Australian alcohol consumption. Australia: Author. Retrieved from http://www.fare.org.au/wp-content/uploads/research/ALCOHOL-POLL-2015-REPORT-27032015.pdf

Fishbein, M., & Azjen, I. Predicting and changing behaviour: the reasoned action approach. New York: Psychology Press; 2010.

Fisher, J. D., & Fisher, W. A. (1992). Changing AIDS-risk behaviour. *Psychological Bulletin, 111*, 455–474.

Fisher, W. A., & Fisher, J. D. (1993). A general social psychological model for changing AIDS risk behavior. In J. Pryor & G. Reeder (Eds.), *The social psychology of HIV infection* (pp. 127–154). Hillsdale, NJ: Erlbaum.

Fisher, W. A., Fisher, J. D., & Harman, J. J. (2003). The information–motivation–behavioral skillsmodel. In J. Suls, & K. A.Wallston (Eds.), Social psychological foundations of health and illness (pp. 82–106).Walden, MA: Blackwell.

Fisher, J. D., Fisher, W. A., Williams, S. S., & Malloy, T.E. (1994). Empirical tests of an information-motivation-behavioral skills model of AIDS-preventive behavior with gay men and heterosexual university students. Health

Psychology, 13, 238-250.

Foster, R. K., & Marriott, H. E. (2006), Alcohol consumption in the new millennium – weighing up the risks and benefits for our health. *Nutrition Bulletin*, *31,* 286–331. doi:10.1111/j.1467-3010.2006.00588.x

French, D. P., & Cooke, R. (2012). Using the theory of planned behaviour to understand binge drinking: The importance of beliefs for developing interventions. *British Journal of Health Psychology*, *17*,1–17. doi: 10.1111/j.2044-8287.2010.02010.x

Fry, M. (2011). 'Seeking the Pleasure Zone: Understanding Young Adult's Intoxication Culture', *Australasian Marketing Journal, 19*(1), 65-70. doi://dx.doi.org/10.1016/j.ausmj.2010.11.009

Furtwængler, N. A. F., & de Visser, R. O. (2013). Lack of international consensus in low risk drinking guidelines. *Drug and Alcohol Review, 32*(1), 11-18.

Furtwängler, N. A. F., & de Visser, R. (2016). University Students' beliefs about unit-based guidelines: A qualitative study. *Journal of Health Psychology*. Advance online publication.

Gill, J. (2002). Reported levels of alcohol consumption and binge drinking within the UK undergraduate population over the last 25 years. *Alcohol and Alcoholism*, *37*, 109–120. doi: 10.1093/alcalc/37.2.109

Gill, J., & O'May, F. (2006). People seem confused about sensible drinking messages. *British Medical Journal, 332,* 302-3.

Gill, J., & O'May, F. (2007a). Practical demonstration of personal daily consumption limits: a useful intervention tool to promote responsible drinking among UK adults? *Alcohol and Alcoholism*, *42*, 436-444.

Gill, J., & O'May, F. (2007b). How 'sensible' is the UK Sensible Drinking message? Preliminary findings amongst newly matriculated female university students in Scotland. J*ournal of Public Health*, *29*, 13-16. doi: 10.1093/pubmed/fdl080

Gmel, G., Kuntsche, E., & Rehm, J. (2010). Risky single-occasion drinking:

bingeing is not bingeing. *Addiction, 106,* 1037–45. DOI: 10.1111/j.1360-0443.2010.03167.x

Gmel, G., & Rehm, J. (2003). Harmful alcohol use. *Alcohol Research and Health*, *27*(1), 52-62.

Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, *4*, 26-42.

Goldsworthy, R., & Coyle, A. (2001). Practitioners' accounts of religious and spiritual dimensions in bereavement therapy. *Counselling Psychology Quarterly*, *14*,183-202.

Goodhart, F. W., Lederman, L. C., Stewart, L. P., & Laitman, L. (2003). Binge drinking: Not the word of choice. *Journal of American College Health, 52*(1), 44-46. doi:10.1080/07448480309595723

Gotham, H. J.; Sher, K. J.; & Wood, P .K. (1997). Predicting stability and change in frequency of intoxication from the college years to beyond: Individual difference and role-transition variables. *Journal of Abnormal Psychology, 106*(4), 619–629.

Graber, R., de Visser, R., Abraham, C., Memon, A., Hart, A. & Hunt, K. (2016). "Staying in the 'sweet spot': A resilience-based analysis of the lived experience of low-risk drinking and abstention among British youth". *Psychology & Health*, *31*, 79-99.

Graham, K., Leonard, K. E., Room, R., Wild, C., Pihl, R. O., Bois, C., & Single, E. (1998). Current directions in research on understanding and preventing intoxicated aggression. *Addiction*, *93*(5), 659–676. doi: 10.1046/j.1360-0443.1998.9356593.x

Graham, K., Wilsnack, R., Dawson, D., & Vogeltanz, N. (1998). Should alcohol consumption measures be adjusted for gender differences? *Addiction, 93,* 1137-47.

Greene, J. C. and Caracelli, V. J. (1997). Defining and describing the paradigm issue in mixed-method evaluation. New Directions for Evaluation, 74, 5–17. doi: 10.1002/ev.1068

Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989) Toward a Conceptual Framework for Mixed-method Evaluation Designs. *Educational Evaluation and Policy Analysis*, 3, 255-274.

Greenfield, T. K., & Kerr, W. C. (2008). Alcohol measurement methodology in epidemiology: recent advances and opportunities. *Addiction*, *103*(7), 1082–1099. doi: 10.1111/j.1360-0443.2008.02197.x

Gual, A., Martos, A. R., Lligoña, A., & Llopis, J. J. (1999). Does the concept of a standard drink apply to viticultural societies? *Alcohol and Alcoholism, 34,* 153-60.

Ham, L. S., & Hope, D. A. (2003). College students and problematic drinking: A review of the literature. *Clinical Psychology Review*, *23*, 719–759.

Harding, R., & Stockley, C. (2007). Communicating through government agencies. *Annal of Epidemiology, 17,* 98–102.
DOI: 10.1016/j.annepidem.2007.01.022

Harford, T. C., Wechsler, H. & Muthen, B. O. (2002). The impact of current residence and high school drinking on alcohol problems among college students. *Journal of Studies on Alcohol*, *63*, 271–279.

Harford, T. C., Wechsler, H., & Muthen, B. O. (2003). Alcohol-related aggression and drinking at off-campus parties and bars: A national study of current drinkers in college. *Journal of Studies on Alcohol and Drugs*, *64*, 704-711. doi: http://dx.doi.org/10.15288/jsa.2003.64.704

Harnett, R., Thom, B., Herring, R., & Kelly, M. (2000). Alcohol in transition: toward a model of young men's drinking styles. *Journal of Youth Studies, 3,* 61–77.

Harrison, L., Kelly, P., Lindsay, J., Advocat, J., & Hickey, C. (2011). 'I don't know anyone that has two drinks a day': Young people, alcohol and the government of pleasure. *Health, Risk and Society, 13*(5), 469–486.

Health and Social Care Information Centre. (2014). Statistics on alcohol 2013: England. London: Author. Retrieved from

http://www.hscic.gov.uk/catalogue/PUB10932/alc-eng-2013-rep.pdf

Health and Social Care Information Centre. (2015). Statistics on alcohol: England, 2015. London: Author. Retrieved from http://www.hscic.gov.uk/catalogue/PUB17712/alc-eng-2015-rep.pdf

Herring, J., Regan, C., Weinberg, D., & Withington, P. (Eds.). (2013). *Intoxication and Society: Problematic Pleasures of Drugs and Alcohol*. London: Palgrave.

Herring, R., Berridge, V., & Thom, B. (2008). Binge drinking: an exploration of a confused concept. *Journal of Epidemiology and Community Health*, *62*, 476–479. doi:10.1136/jech.2006.056721.

Hingson, R. W., Heeren, T., Zakocs, R. C., Kopstein, A., & Wechsler, H. (2002). Magnitude of alcohol-related morbidity and mortality among U.S. college age students 18–24. *Journal of Studies on Alcohol*, *63*,136–144. doi: 10.1146/annurev.publhealth.26.021304.144652

Home Office. (2012). The Government's Alcohol Strategy. Available at: https://www.gov.uk/government/publications/alcohol-strategy (accessed on 07 June 2015).

Irving, H. M., Samokhvalov, A. V., & Rehm, J. (2009). Alcohol as a risk factor for Pancreatitis: A systematic review and meta-analysis. *Journal of the Pancreas, 10,* 387-92.

Jackson, R., Broad, J., Connor, J., & Wells, S. (2005). Alcohol and ischaemic heart disease: probably no free lunch. *Lancet*, *366,* 1911–12. doi: http://dx.doi.org/10.1016/S0140-6736(05)67770-7

Jayne, M., Valentine, G., & Holloway, S. L. (2011). Alcohol, Drinking, Drunkenness: (Dis)Orderly Spaces. Ashgate, Aldershot.

Jefferis, B. J., Power, C., & Manor, O. (2005). 'Adolescent drinking level and adult binge drinking in a national birth cohort', *Addiction*, *100(4)*, 543–549. doi: 10.1111/j.1360-0443.2005.01034.x

Jernigan, D. H., Monteiro, M., Room, R., & Saxena, S. (2000). Towards a global

alcohol policy: alcohol, public health and the role of WHO. *Bulletin of the World Health Organisation*, *78*, 491-9.

Johnson, R. B., & A.J. Onquegbuzie, A. J. (2004). Mixed methods research: a paradigm whose time has come. *Educational Researcher*, 33 (*7*), 14–26.

Johnson, R. B., & A.J. Onquegbuzie, A. J., & Turner, L. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research, 2,* 112-133.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2010). Monitoring the Future national survey results on drug use, 1975–2009. Volume I: Secondary school students. (NIH Publication No. 10-7584). Bethesda, MD: National Institute on Drug Abuse.

Johnston, K. L., & White, K. M. (2003). Binge-drinking: A test of the role of group norms in the theory of planned behaviour. *Psychology & Health*, *18*, 63–77. doi:10.1080/0887044021000037835

Jones, S. C., & Gregory, P. (2009). The impact of more visible standard drink labelling on youth alcohol consumption: helping young people drink (ir)responsibly? *Drug and Alcohol Review*, *28*, 230–4. doi: 10.1111/j.1465-3362.2008.00020.x

Katikireddi, S. V., & Mclean, J. A. (2012). Introducing a minimum unit price for alcohol in Scotland: considerations under European law and the implications for European public health [commentary]. *European Journal of Public Health, 22*, 457-458. doi*:* http://dx.doi.org/10.1093/eurpub/cks091

Kelly J. F., Hoeppner B., Stout R. L., Pagano M. (2012). Determining the relative importance of the mechanisms of behavior change within Alcoholics Anonymous: a multiple mediator analysis. *Addiction*; *107*, 289–99. doi: 10.1111/j.1360-0443.2011.03593.x

Kerr, W. C., Greenfield, T. K., Tujague, J., & Brown, S. E. (2005). A Drink Is A Drink? Variation in the Amount of Alcohol Contained in Beer, Wine and Spirits Drinks in a US Methodological Sample. *Alcoholism: Clinical and*

Experimental Research, *29*, 2015-2021.
doi: 10.1097/01.alc.0000187596.92804.bd

Kerr, W. C., & Stockwell, T. (2012). Understanding standard drinks and drinking guidelines. *Drug and Alcohol Review, 31*(2), 200–205.
doi: 10.1111/j.1465-3362.2011.00374.x

Klatsky, A. L. (2010). Alcohol and cardiovascular health. *Physiology and Behaviour*, *100*(1), 76-81. doi: 10.1016/j.physbeh.2009.12.019.

Kroll, T., & Neri, M. (2009). Designs for Mixed Methods Research, in Mixed Methods Research for Nursing and the Health Sciences (eds S. Andrew and E. J. Halcomb), Wiley-Blackwell, Oxford, UK.
doi: 10.1002/9781444316490.ch3

Kuntsche, E., & Cooper, L. (2010). Drinking to have fun and to get drunk: Motives as predictors of weekend drinking over and above usual drinking habits. *Drug and Alcohol Dependence, 110*(3), 259–262.

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2005). Why do young people drink? A review of drinking motives. *Clinical Psychology Review, 25,* 841-61.

Kypri, K., Cronin, M., & Wright, C. S. (2005). Do University students drink more hazardously than their non-student peers? *Addiction*, *100*,713–714.
doi:10.1111/j.1360-0443.2005.01116.x

Lee, G. A., & Forsythe, M. (2011). Is alcohol more dangerous than heroin? The physical, social and financial costs of alcohol. *International Emergency Nursing*, *19*, 141-145. doi: 10.1016/j.ienj.2011.02.002

Lonsdale, A., Hardcastle, S. J., & Hagger, M.S. (2012.) A minimum price per unit of alcohol: A focus group study to investigate public opinion concerning UK government proposals to introduce new price controls to curb alcohol consumption. *BMC Public Health, 12*(1),1023. doi:10.1186/1471-2458-12-1023

Lovatt, M., Eadie, D., Meier, P. S., Li, J., Bauld, L., Hastings, G., & Holmes, J. (2015). Lay epidemiology and the interpretation of low-risk drinking

guidelines by adults in the United Kingdom. *Addiction, 110*, 1912-9. doi: 10.1111/add.13072.

Lyons, A., & Willott, S. (2008). Alcohol consumption, gender identities and women's changing social positions. *Sex Roles*, *59*(9), 694-712.

MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding, and suppression effect. *Prevention Science*, *1*, 173–181. doi: 10.1023/A:1026595011371

MacLean, S. (2016). Alcohol and the constitution of friendship for young adults. Sociology, *50. 93-108. doi: 10.1177/0038038514557913*

Maggs, J. C., Williams, L. R., & Lee, C. M. (2011). Ups and downs of alcohol use among first-year college students: Number of drinks, heavy drinking, and stumble and pass out drinking days. *Addictive Behaviours*, *36*(3), 197-202. doi: 10.1016/j.addbeh.2010.10.005

Maisto, S. A., Carey, M. P., Carey, K. B., Gordon, C. M., & Schum, J. L. (2004). Effects of alcohol and expectancies on HIV-related risk perception and behavioral skills in heterosexual women. *Experimental Clinical Psychopharmacology*, *12*, 288–297.

Martin-Moreno, J., Harris, M. E., Breda, J., Møller, L., Alfonso-Sanchez, J.L., & Gorgojo, L. (2013). Enhanced labelling on alcoholic drinks: Reviewing the evidence to guide alcohol policy. *European Journal of Public Health*, *23*, 1-6. doi: 10.1093/eurpub/ckt046

May, P. A., & Gossage, J. P. (2001). Estimating the prevalence of fetal alcohol syndrome: A summary. *Alcohol Research and Health, 25,*159–167.

Mayberry, L., & Osborn, C. (2014). Empirical validation of the information-motivation-behavioural skills model of diabetes medication adherence: a framework for intervention. *Diabetes Care*, *37*(5), 1246-53. doi: 10.2337/dc13-1828.

McMillan, B., & Conner, M. (2003). Using the theory of planned behaviour to understand alcohol and tobacco use in students. *Psychology, Health & Medicine*, *8*, 317–328. doi:10.1080/1354850031000135759

McCabe, S. E., Cranford, J. A.; Morales, M., & Young, A. (2006). Simultaneous and concurrent polydrug use of alcohol and prescription drugs: Prevalence, correlates, and consequences. *Journal of Studies on Alcohol,* 67, 529–537.

Meng, Y., Hill-McManus, D., Brennan, A., & Meier P. (2012). Model-based appraisal of alcohol minimum pricing and off-licensed trade discount bans in Scotland using the Sheffield alcohol policy model (v 2): Second update based on newly available data. Sheffield, UK: ScHARR University of Sheffield. https://www.shef.ac.uk/polopoly_fs/1.156503!/file/scotlandjan.pdf

Misovich, J., Martinez, T., Fisher J. D., Bryan, A., & Catapano, N. (2003). Predicting breast self-examination: A test of the information-motivation-behavioral skills model. *Journal of Applied Social Psychology*, *33*(4), 775–790. doi: 10.1111/j.1559-1816.2003.tb01924.x

Mohapatra, S., Patra, J., Popova, S., Duhig, A., & Rehm, J. (2010). Social cost of heavy drinking and alcohol dependence in high-income countries. *International Journal of Public Health, 55*(3),149-157.

Molina-Azorin, J., & Cameron, R. (2010). The application of mixed methods in organizational research: a literature review. *Electronic Journal of Business Research Methods, 8*, 95-105.

Monitoring the Future Survey. (2015). National survey on drug use: 1975-2015. Available at http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2015.pdf

Moreira, M. T., Smith, L. A., & Foxcroft, D. (2009). Social norms interventions to reduce alcohol misuse in university or college students. Cochrane Database of Systematic Reviews, 3:CD006748. doi: 10.1002/14651858.CD006748.pub2.

Morgan, D. (1998) "Practical Strategies for Combining Qualitative and Quantitative Methods: Applications to Health Research", *Qualitative Health Research,* 8, 362-376.

Morse, J. & Niehaus, L. (2009). *Mixed Method Design: Principles and Procedures*.

Walnut Creek, CA, USA: Left Coast Press Inc.

Mullen, K., Watson, J., Swift, J., & Black, D. (2007). Young men, masculinity and alcohol. *Drugs: Education, Prevention and Policy*, *14,* 151–65.

Mumenthaler, R., Taylor, J. L., O'Hara, R., & Yesavage, J. A. (1999). Gender differences in moderate drinking effects. *Alcohol Research and Health, 23*(1), 55-64.

Murphy, J. G., Correia, C. J., Colby, S. M., & Vuchinich, R. E. (2005). Using behavioural theories of choice to predict drinking outcomes following a brief intervention. *Experimental and Clinical Psychopharmacology*, *13*,93–101. doi: 10.1037/1064-1297.13.2.93

Measham, F. (2006). The new policy mix: Alcohol, harm minimisation, and determined drunkenness in contemporary society. *International Journal of Drug Policy, 17,* 258-68.

Miller, W. R., Heather, N., & Hall, W. (1991). Calculating standard drink units: international comparisons. *British Journal of Addiction, 86,* 43-7.

National Health & Medical Research Council. (2009). *Australian Guidelines to Reduce Health Risks from Drinking Alcohol*. Canberra: NHMRC.

National Health & Medical Research Council. (2012). New national guidelines for alcohol consumption. Available at: http://www.alcohol.gov.au/internet/alcohol/publishing.nsf/Content/36E6FEE732C8DF1BCA25767200769CD8/$File/adult.pdf (Retrieved 01 May 2016).

Nairn, K., Higgins, J., Thompson, B., Anderson, M., & Fu, N. (2006). 'It's just like the teenage stereotype. You go out and drink and stuff': hearing from young people who don't drink. *Journal of Youth Studies*, *9*(3), 287-304.

Nezlek, J. B., Pilkington, C. J., & Bilbro, K. G. (1994). Moderation in excess: Binge drinking and social interaction among college students. *Journal of Studies on Alcohol*, *55*, 342–351. doi: http://dx.doi.org/10.15288/jsa.1994.55.342

Newbury-Birch, D., White, M., & Kamali, F. (2000). Factors influencing alcohol and illicit drug use amongst medical students. *Drug and Alcohol Dependence*,

59(2), 125–130. doi: 10.1016/S0376-8716(99)00108-8

National Centre for Health Satistics. (2005). Health , United States, 2005. Available from: http://www.cdc.gov/nchs/data/hus/hus05.pdf (accessed 15 June 2015).

NHS. (2015a). Alcohol units - Live Well - NHS Choices. Available from: http://www.nhs.uk/Livewell/alcohol/Pages/alcohol-units.aspx (accessed 15 June 2015).

NHS. (2015b). Track your drinks with our free smartphone app | Change4Life. Available from: http://www.nhs.uk/Change4Life/Pages/drinks-tracker-mobile-app.aspx (accessed 15 June 2015).

NHS Choices. (2015). Alcohol units - Live Well - NHS Choices. Retrieved from: http://www.nhs.uk/Livewell/alcohol/Pages/alcohol-units.aspx (accessed 15 June 2015).

Niland, P., Lyons, A. C., Goodwin, I., & Hutton, F. (2013). Everyone can loosen up and get a bit of a buzz on: Young adults, alcohol and friendship practices. *International Journal of Drug Policy*, *24*(6), 530-537. http://dx.doi.org/10.1016/j.drugpo.2013.05.013

Nohre, L., MacKinnon, D. P., Stacy, A. W., & Pentz, M. A. (1999). The association between adolescents' receiver characteristics and exposure to the alcohol warning label. *Psychology and Marketing*, *16*,245–259. doi: 10.1002/(SICI)1520-6793(199905)16:3<245::AID-MAR4>3.0.CO;2-S

Norman, P., & Conner, M. (2006). The theory of planned behaviour and binge drinking: Assessing the moderating role of past behaviour within the theory of planned behaviour. *British Journal of Health Psychology*, *11*, 55–70. doi:10.1348/135910705X43741

Nöstlinger, C., Niderost, S., Platteau, T., Muller, M. C., Stanekova, D., Gredig, D., et al. (2011). Sexual protection behavior in HIV-positive gay men: Testing a modified Information-Motivation-Behavioral skills model. *Archive of*

Sexual Behaviour, 40, 817–827. doi: 10.1007/s10508-010-9682-4

Office of Applied Studies. (2003). The NSDUH Report: Alcohol Use and Risks among Young Adults by College Enrollment Status. Substance Abuse and Mental Health Services Administration; Rockville, MD.

Office for National Statistics. (2008). *Focus on consumer price indices*. London: Office for National Statistics.

Office for National Statistics. (2010). *Drinking: Adults' Behaviour and Knowledge in 2009*. Newport: ONS.

Office for National Statistics. (2015). Adult Drinking Habits in Great Britain, 2013. Available at: http://www.ons.gov.uk/ons/rel/ghs/opinions-and-lifestyle-survey/adult-drinking-habits-in-great-britain--2013/stb-drinking-2013.html (accessed 07 June 2015).

Office for National Statistics. (2016). Adult Drinking Habits in Great Britain: 2014. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/drugusealcoholandsmoking/bulletins/opinionsandlifestylesurveyadultdrinkinghabitsingreatbritain/2014 (retrieved 10 April 2016).

Office of Diseases Prevention and Health Promotion. 2010. Dietary guidelines for Americans, 2010. Available at: http://health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf (retrieved 15 June 2015)

Orford, J., Krishnan, M., Balaam, M., Everitt, M., & van Der Graaf, K. (2004). University student drinking: The role of motivational and social factors. *Drugs: Education, Prevention and Policy*, *11*,407–421. doi:10.1080/09687630310001657944

Ostlund, U., Kidd, L., Wengstrom, Y., & Rowa-Dewar, N. (2011). Combining qualitative and quantitative research within mixed method research designs: a methodological review. I*nternational Journal of Nursing Studies, 48*(3),

369-383.
doi: 10.1016/j.ijnurstu.2010.10.005

Palk, G., Davey, J., & Freeman, J. (2007). Policing alcohol-related incidents: A study of time and prevalence. *Policing*, *30*,82–92.
doi: http://dx.doi.org/10.1108/13639510710725631

Park, C. L. (2004). Positive and negative consequences of alcohol consumption in college students. *Addictive Behaviours*, *29*, 311–321.
doi: 10.1016/j.addbeh.2003.08.006

Perkins, H. W. (2002). Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies on Alcohol*, *14*,91–100.
doi: http://dx.doi.org/10.15288/jsas.2002.s14.91

Petticrew, M., Douglas, N., Knai, C., Durand, M. A., Eastmure, E., & Mays, N. (2015). Health information on alcoholic beverage containers: has the alcohol industry's pledge in England to improve labelling been met?. *Addiction*.
doi: 10.1111/add.13094

Piacentini, M. G., & Banister, E. N. (2008.) Managing anti-consumption in an excessive drinking culture. Journal of Business Research, 62, 279-288.
doi: 10.1016/j.jbusres.2008.01.035

Posavac, E. J. (1993). College students' views of excessive drinking and the university's role. *Journal of Drug Education*, *23,* 237–245.

Presley, C. A., & Pimentel, E. R. (2006). The introduction of heavy and frequent drinker: A proposed classification to increase accuracy of alcohol assessments in postsecondary educational settings. *Journal of Studies on Alcohol*, *67*, 324–332.
DOI: http://dx.doi.org/10.15288/jsa.2006.67.324

Preventative Health Task force (PHT). (2009). Australia: The Healthiest Country by 2020 –National Preventative Health Strategy – the roadmap for action. Available at

http://www.preventativehealth.org.au/internet/preventativehealth/publishing.nsf/Content/CCD7323311E358BECA2575FD000859E1/$File/nphs-roadmap.pdf

Puddey, I. B., Rakic, V., Dimmitt, S. B., & Beilin, L. J. (1999). Influence of pattern of drinking on cardiovascular disease and cardiovascular risk factors-a review. Addiction, 94, 649–663. doi:10.1046/j.1360-0443.1999.9456493.x

Quigg, Z., Hughes, K., & Bellis, M.A. (2013). Student drinking patterns and blood alcohol concentration on commercially organised pub crawls in the UK. *Addictive Behaviours*, *38*, 2924-2929. doi: 10.1016/j.addbeh.2013.08.029

Rainie, H. The changing online population: It's more and more like the general population. [Online] Pew Internet and American Life Project report. Available: http://www.pewinternet.org/reports/index.asp[2001, October, 9]

Read, J. P., Beattie, M., Chamberlain, R., & Merrill, J. E. (2008). Beyond the "binge" threshold: Heavy drinking patterns and their association with alcohol involvement indices in college students. Addictive Behaviours, *33,* 225–234.
doi: 10.1016/j.addbeh.2007.09.001

Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet*, *373*(9682), 2223-2233. doi:10.1016/S0140-6736(09)60746-7

Rehm, J., & Patra, J. (2012). Different guidelines for different countries? On the scientific basis of low-risk drinking guidelines and their implications. *Drug and Alcohol Review*, *31,* 156–161. doi: 10.1111/j.1465-3362.2011.00395.x

Rehm, J., Room, R., Graham, K., Monteiro, M., Gmel, G., & Sempos, C. (2003). The relationship of average volume of alcohol consumption and patterns of drinking to burden of disease—an overview. *Addiction*, *98*, 1209–1228. doi:10.1016/S0140-6736(09)60746-7

Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, K., Rehn, N., Sempos, C. T., & Jernigan, D. (2003). Alcohol as a Risk Factor for Global Burden of Disease.

European Addiction Research, 9, 157-64.

Rehm, J., Room, R., & Taylor, B. (2008). Method for moderation: measuring lifetime risk of alcohol-attributable mortality as a basis for drinking guidelines. *International Journal of Methods in Psychiatric Research*, *17*(3), 141-51. doi: 10.1002/mpr.259.

Reynolds, K., Lewis, L. B., Nolan, J. D. L., Kinney, G. L., Sathya, B., & He., J. (2003). Alcohol consumption and risk of stroke: A meta-analysis". *Jounal of American Medicine Association, 289,* 579-88.

Reynolds, F., & Lim, K. H. (2007). Contribution of visual art-making to the subjective well-being of women living with cancer: A qualitative study. *Arts in Psychotherapy*, *34*, 1-10.

Rodgers, B., Korten, A. E., Jorm, A. F., Jacomb, P. A., Christensen, H., & Henderson, A. S. (2000). Non-linear relationships in associations of depression and anxiety with alcohol use. *Psychological Medicine, 30,* 421-32.

Room, R., Babor, T. F., & Rehm, J. (2005). Alcohol and public health. Lancet, 365, 519-30. doi: http://dx.doi.org/10.1016/S0140-6736(05)17870-2

Room, R., & Mäkelä, K. (2000). Typologies of the cultural position of drinking. *Journal of Studies on Alcohol and Drugs*, *61,* 475-83.

Room, R., & Rehm, J. (2012). Clear criteria based on absolute risk: reforming the basis of guidelines on low-risk drinking. *Drug & Alcohol Review, 31,* 135-40.

Royal College of Psychiatrists (2011). *Our Invisible Addicts*. London: Royal College of Psychiatrists.

Scarborough, P., Bhatnagar, P., Wickramasinghe, K. K., Allender, S., Foster, C. & Rayner, M. (2011). The economic burden of ill health due to diet, physical inactivity, smoking, alcohol and obesity in the UK. *Journal of Public Health, 33*(4), 527-535.

Scarborough, P., Burg, M. R., Foster, C., Swinburn, B., Sacks, G., Rayner, M., Webster, P., & Allender, S.(2011). Increased energy intake entirely accounts

for increase in body weight in women but not men in the UK between 1986 and 2000. British Journal of Nutrition, 105, 1399-1404. doi: 10.1093/pubmed/fdr033

Seaman, P., & Ikegwuonu, T. (2010). Drinking to belong: Understanding young adult alcohol use within social networks. Report, Joseph Rowntree Foundation, York.

Sheeran, P., Conner, M., & Norman, P. (2001). Can the theory of planned behaviour explain patterns of health behaviour change? *Health Psychology*, *20*, 12-19.

Smith, J. A. (2011). Evaluating the contribution of interpretative phenomenological analysis. Health Psychology Review, 5(1), 9–27.

Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative Phenomenological Analysis: Theory, Method and Research*. London: Sage.

Smith, L., & Foxcroft, D. R. (2009). Drinking in the UK: an exploration of trends. Joseph Rowntree Foundation, York (2009).

Smith, J. & Osborn, M. (2003). Interpretive phenomenological analysis. In J.A. Smith (Ed.) Qualitative psychology: A practical guide to research methods (pp.51-80). London: Sage.

Snow, P.,Wallace, S., Staiger, P., & Stolz-Grobusch, B. (2003). As long as it doesn't spill over into class: Harm arising from students' alcohol use, and the role of policy in reducing them. *The International Journal on Drug Policy*, *14*,5–16. doi: http://dx.doi.org/10.1016/S0955-3959(02)00198-6

Starace, F., Massa, A., Amico, K. R., & Fisher, J.D. (2006). Adherence to antiretroviral therapy: an empirical test of the Information-Motivation-Behavioral Skills model. Health *Psychology, 25*, 153–162 21.

Stock, C., Mikolajczyk, R. T., Bloomfield, K., Maxwell, A. E., Ozcebe, H., Petkeviciene, J., Naydenova, V., Marin-Fernandez, B., El-Ansari, W., Krämer, A. (2009). Alcohol consumption and attitudes towards banning alcohol sales on campus among European university students. *Public Health*, *123*(2), 122–129. doi: 10.1016/j.puhe.2008.12.009

Stockwell, T., Butt, P., Beirness, D., Gliksman, L., & Paradis, C. (2012). The basis for Canada's new low-risk drinking guidelines: A relative risk approach to estimating hazardous levels and patterns of alcohol use. *Drug and Alcohol Review*, *31,* 126–134. doi: 10.1111/j.1465-3362.2011.00342.x

Sutton, S. (2002). Using social cognition models to develop health behaviour interventions: Problems and assumptions. In D. Rutter & L. Quine (Eds.), Changing health behaviour (pp. 193–208). Buckingham , Philadelphia : Open University Press.

Sutton, S. (2010). Using social cognition models to develop health behaviour interventions: The theory of planned behaviour as an example. In D. French, K. Vedhara, A. A. Kaptein, & J. Weinman (Eds.), Health Psychology (2nd ed., pp. 122–134). Chichester : Wiley-Blackwell.

Szmigin, I., Griffin, C., Mistral, W., Bengry-Howell, A., Weale, L., & Hackley, C. (2008). Re-framing 'binge drinking' as calculated hedonism: empirical evidence from the UK. *International Journal of Drug Policy, 19,* 359–66. doi: http://dx.doi.org/10.1016/j.drugpo.2007.08.009

Taylor, B., Irving, H. M., Baliunas, D., Roerecke, M., Patra, J., Mohapatra, S., & Rehm, J.. (2009). Alcohol and hypertension: Gender differences in dose-response relationships determined through systematic review and meta-analysis. *Addiction, 104,* 1981-90.

Taylor, B., Irving, H. M., Kanteres, F., Room, R., Borges, G., Cherpitel, C., Greenfield, T., & Rehm, J. (2010). The more you drink, the harder you fall: a systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. *Drug & Alcohol Dependence, 110,* 108-16.

doi: 10.1016/j.drugalcdep.2010.02.011.

Teddlie, C., & Tashakkori, A. (2009). Foundations of mixed methods research. Thousand Oaks, CA: Sage Publications.

Thompson, K., Stockwell, .T, & MacDonald, S. (2012). Is there a 'low- risk'

drinking level for youth? The risk of acute harm as a function of quantity and frequency of drinking. *Drug and Alcohol Review*, *31*, 184–93. doi: 10.1111/j.1465-3362.2011.00378.x.

Tsai, J., Floyd, R. L., & Bertrand, J. (2007).Tracking binge drinking among US childbearing-age women. *Preventive Medicine*, *44*(4), 298–302. doi: 10.1016/j.ypmed.2006.10.002

Turner, C. (1990). How much alcohol is in a "standard drink"? An analysis of 125 studies. *British Journal of Addiction, 85*, 1171-1175. doi: 10.1111/j.1360-0443.1990.tb03442.x

Velázquez, C. E., Pasch, K. E., Laska, M. N., Lust, K., Story, M., & Ehlinger, E.P. (2011). Differential prevalence of alcohol use among 2-year and 4-year college students**.** *Addictive Behaviours*, *136,* 1353–1356. doi: 10.1016/j.addbeh.2011.07.037

Vik, P. M., Culbertson, K. A., & Sellers, K. (2000). Readiness to change drinking among heavy-drinking college students. *Journal of Studies on Alcohol*, *61*, 674–680.
doi: http://dx.doi.org/10.15288/jsa.2000.61.674

Wagenaar, A. C., Salois, M. J., & Komro, K. A. (2009). Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction, 104,* 179–190. doi: 10.1111/j.1360-0443.2008.02438.x

Wakefield, M. A., Loken, B., & Hornik, R.C. (2010). Use of mass media campaigns to change health behaviour. *Lancet, 376,* 1261–1271.
doi: http://dx.doi.org/10.1016/S0140-6736(10)60809-4

Webb, E., Ashton. C. H., Kelly, P., & Kamali, F. (1996). Alcohol and drug use in UK university students. *The Lancet*, *348*, 922-925. doi: 10.1016/S0140-6736(96)03410-1

Wechsler, H., Dowdall, G. W., Davenport, A. E., & Castillo, S. (1995). Correlates of college student binge drinking. *American Journal of Public Health*, *85*,

921–926. doi: 10.2105/AJPH.85.7.921

Wettlaufer, A., Cukier, S., Giesbrecht, N., & Greenfield, T. K. (2012). The marketing of responsible drinking: Competing voices of interests. *Drug and Alcohol Review*, *31*, 231-239. doi: 10.1111/j.1465-3362.2011.00403.x

White, A. M., Kraus, C. L., Flom, J. D., Kestenbaum, L. A., Mitchell, J. R., Shah, K., & Swartzwelder, H. S. (2005). College students lack knowledge of standard drink volumes: implications for definitions of risky drinking based on survey data. *Alcoholism: Clinical & Experimental Research, 29*(4), 631-638.

Wicki, M., Kuntsche, E., & Gmel, G. (2010). Drinking at European universities? A review of students' alcohol use. *Addictive Behaviours*, *35*,913–924. doi: 10.1016/j.addbeh.2010.06.015

Wilkinson, C., Allsop, S., & Chikritzhs, T. (2011). Alcohol pouring practices among 65- 74-year-olds in Western Australia. *Drug and Alcohol Review*, *30*, 200-206. doi: 10.1111/j.1465-3362.2010.00218.x

Rehm, J. T., Bondy, S. J., Sempos, C. T.; & Vuong, C. V. (1996). Alcohol consumption and coronary heart disease morbidity and mortality. *American Journal of Epidemiology*, *146*(6):495–501. doi: 10.1093/oxfordjournals.aje.a009303

Scholes-Balog, K.E., Heerde, J.A., & Hemphill, S.A. (2012). Alcohol warning labels: unlikely to affect alcohol-related beliefs and behaviours in adolescents. *Australian and New Zealand Journal of Public Health*, *36*(5), 524-529. doi: 10.1111/j.1753-6405.2012.00934.x

Stockley, C. S. (2001). The effectiveness of strategies such as health warning labels to reduce alcohol-related harms–an Australian perspective, *12,* 153–166. doi: http://dx.doi.org/10.1016/S0955-3959(01)00077-9

Stuart, S. A. (2010). The relationship between mandatory and other food label information. *British Food Journal*, *1*, 21-31. doi http://dx.doi.org/10.1108/00070701011011173

Turner, C. (1990). How much alcohol is in a 'standard drink'? An analysis of 125 studies. *British Journal of Addiction*, *85*, 1171–1175. doi: 10.1111/j.1360-0443.1990.tb03442

White, A. M., Kraus, C. L., Flom, J. D., Kestenbaum, L. A., Mitchell, J. R., Shah K., Swartzwelder, H. S. (2005). College students lack knowledge of standard drink volumes: implications for definitions of risky drinking based on survey data. *Alcoholism: Clinical & Experimental Research* 29(4): 631-638.

Wilkinson, C., & Room, R. (2009). Warnings on alcohol containers and advertisements: International experience and evidence on effects. *Drug and Alcohol Review*, *28*, 426-435. doi: 10.1111/j.1465-3362.2009.00055.x

World Health Organization. (1999). *European Alcohol Action Plan 2000-2005*. Copenhagen: WHO Regional Office for Europe.

World Health Organization. (2002). *World Health Report 2002*. Geneva: WHO.

World Health Organization. (2006). *Framework for Alcohol Policy in the WHO European Region*. Copenhagen: WHO.

World Health Organisation. (2007). *Expert Committee on Problems Related to Alcohol Consumption, Geneva, 10–13 October 2006*. Geneva: WHO.

World Health Organization. (2009). *Global Status report on Road Safety*. Geneva: WHO.

World Health Organization. (2010). *Strategies to Reduce the Harmful Use of Alcohol: Draft Global Strategy*. Available at: http://apps.who.int/gb/ebwha/pdf_files/WHA63/ A63_13-en.pdf (Retrieved 01 November 2010)

World Health Organization Regional Office for Europe. (2011). *A healthy lifestyle*. Available at: http://www.euro.who.int/en/what-we-do/health-topics/disease-prevention/nutrition/a-healthy-lifestyle (Retrieved 01 November 2010)

Yardley, L. and Bishop, F. L. (2015), Using mixed methods in health research: Benefits and challenges. *British Journal of Health Psychology, 20*, 1–4.

doi: 10.1111/bjhp.12126

Zador, P. L., Krawchuk, S. A., & Voas, R. B. (2000). Alcohol-related relative risk of driver fatalities and driver involvement in fatal crashes in relation to driver age and gender: An update using 1996 data. *Journal of Studies on Alcohol*, *61*, 387–395. doi: http://dx.doi.org/10.15288/jsa.2000.61.387

Zador, P. L., Krawchuk, S. A., & Voas, R. B. (2000). *Relative Risk of Fatal Crash Involvement by BAC, Age and Gender*. Washington, DC: National Highway Traffic Safety Administration.

Zajdow, G., & MacLean, S. (2014). "I Just Drink for That Tipsy Stage": Young Adults and Embodied Management of Alcohol Use. *Contemporary Drug Problems*, *41(*4), 522-535. doi: 10.1177/0091450914567123.

Zhu, C., Cai, Y., Ma, J., Li, N., Zhu, J., He, Y., Redmon, P., & Qiao, Y. (2013). Predictors of intention to smoke among junior high school students in Shanghai, China: an empirical test of the information-motivation-behavioral skills (IMB) model. *PLos One*, *8*(11):e80482. doi: 10.1371/journal.pone.0080482

APPENDIX A Ethical Approval Form

Life Sciences & Psychology Cluster based Research Ethics Committee	
CERTIFICATE OF APPROVAL	
Reference Number:	RDVNF1110
Title of Project:	Knowledge, use and attitudes towards the units of alcohol system and the governmental “sensible drinking” message in young adults
Principal Investigator:	Richard De Visser
Student:	Nina Furtwangler
Collaborators:	
Duration of Approval (not greater than 4 years)	12 months
Expected Start Date:*	December 2010

This project has been given ethical approval by the Life Sciences and Psychology Cluster based Research Ethics Committee (C-REC).

*NB. If the actual project start date is delayed beyond 12 months of the expected start date, this Certificate of Approval will lapse and the project will need to be reviewed again to take account of changed circumstances such as legislation, sponsor requirements and University procedures.

Please note and follow the requirements for approved submissions:

Amendments to protocol.

4) Any changes or amendments to approved protocols must be submitted to the C-REC for authorisation prior to implementation.

Feedback regarding the status and conduct of approved projects

5) Any incidents with ethical implications that occur during the implementation of the project must be reported immediately to the Chair of the C-REC.

The principal investigator is required to provide a brief annual written statement to the committee, indicating the status and conduct of the approved project. These reports will be reviewed at the annual meeting of the committee. A statement by the Principal Investigator to the C-REC indicating the status and conduct of the approved project will be required on the following date(s):

December 2011……

Authorised Signature	Jennifer Rusted
Name of Authorised Signatory (C-REC Chair or nominated deputy)	**Jennifer Rusted**
Date	3.12.2010

APPENDIX B

INTERVIEW TOPIC GUIDE

The aim of this study is to look at people's experiences of drinking and whether and how they monitor their alcohol intake.

To start off, could you please tell me a little bit about you: how often do you drink, and when you are drinking, what do you drink?

- How do you think this compares to other women your age

- How do you think this compares to other men your age

What are the good things about drinking? [why do you drink?]

What are the bad things about drinking? [why do you limit drinking?]

What affect do you think drinking has on your health in the short-term?

- and in the long-term?

- how concerned are you about these health effects of drinking?

Can you please tell me about the most recent day when you drank alcohol?

- what did you drink? [be specific]

- what influenced what you drank and how much you drank? Did you have a pre-determined limit?

- how much attention did you give to how much you were drinking?

- at what point did you decide to stop drinking? why?

- how many units did you think you had?

- did you think about your alcohol intake in terms of units?

When do you usually decide to slow down or stop drinking?

How often do you drink even when you don't want to? - or drink more than you want to?

In general, how much attention do you give to units of alcohol?

Can you describe the government’s guidelines for units of alcohol?

- insert task using images - use as a discussion point rather than for measurement

- suggestion of 2 days alcohol-free - what do they think? why?

How did you learn about these guidelines?

How familiar do you feel with these guidelines?

- How often do you use them to monitor your own behaviour?

How motivated are you to adhere to these guidelines?

- If you wanted to, how easy would it be to them?

How useful do you think unit-based guidelines are?

- How many units of alcohol do you think the daily limits should be?

Can you think of a better way to help people monitor their alcohol use?

- How would you improve on these guidelines

- Even if the guidelines were improved, how much attention would give to them?

Can you think of an effective message to discourage heavy drinking?

[either an actual past campaign or one you think might work]

Any other comments / suggestions

Thanks, etc.

1 2 3 4 5

How many units of alcohol are contained in each product shown above?
Please be precise - e.g. "1.3 units"

1 2 3 4

How many units of alcohol are contained in each product shown above?
Please be precise - e.g. "1.3 units"

APPENDIX C Interviews Summary Table

Interviews Number		VN31012012 F	VN870010 M	VN870011 M	VN870012 M	VN870015 F	VN870016 F	VN870017 F	VN870018 M	VN870019 F	VN870020 F	VN870021F	VN870022 F
Positive things about drinking	Relax/chilling	X	X				X	X			X	X	
	Have fun/ hang out with friends	X	X	X	X	X	X			X		X	X
	Meet new people/ socialise	X			X	X							
	Lower inhibitions/ Confidence boost		X	X	X	X						X	X
	Gives you high energy/ keeps you going on a night out			X	X		X					X	
	Forget about problems					X	X						
	Constructed social image of yourself								X				
	Taste	X		X				X	X	X	X		X
Negative things about drinking	Hangovers	X	X	X	X	X	X	X	X	X	X	X	X
	General Health Risk	X		X		X					X		
	Heart			X				X				X	X
	Cancer				X								
	Brain Damage				X				X	X	X		X
	Calorie content of alcohol							X	X		X		X
	Becoming aggressive							X					
	Liver disease/ cirrhosis	X	X	X					X	X	X	X	X
	Alcohol dependence	X	X				X						
	Embarrass Yourself		X			X						X	
	Becoming an annoyance to others		X				X			X			
	Hurting yourself or others		X		X	X							
	Blackouts/ Passing out		X							X			
	Psychological Impact		X				X						
	Dehydration			X							X		
	Put yourself in dangerous situations			X	X		X						
	Peer pressure			X		X						X	
	Feeling tired					X							
	Being sick					X							X
	Eating too much when drunk						X						
	Recovering Time the next day								X		X		
	Choking on their own vomit									X			
Individual Strategies to control alcohol intake	Get enough sleep/ stop drinking early because commitments the next day	X										X	
	Pay attention to how you feel (tipsy, too drunk, head spinning, slurring...)	X	X	X	X	X	X	X	X	X	X	X	X
	Drink alcohol of choice		X	X		X	X				X		
	Pacing yourself/ drink water		X	X	X				X				
	Know your limit/ Stay in control		X	X	X	X	X	X			X		X
	Bring your own drinks and stick to them		X										X
	Pour your own drinks					X							
	Set yourself a pre-determined limit			X									
	Use units to see what is best value for money				X								
	Stick to 2 nights/week to go out					X							
	Abstinence						X						
	Drink while eating									X			

Interviews Number		VN31012012 F	VN870010 M	VN870011 M	VN870012 M	VN870015 F	VN870016 F	VN870017 F	VN870018 M	VN870019 F	VN870020 F	VN870021F	VN870022 F
Attitude towards Guidelines	Knows daily guidelines for men and women	X				X	X	X	X	X	X	X	X
	Don't know weekly guidelines	X				X	X	X	X	X	X	X	X
	2 alcohol-free days is good idea	X	X	X	X	X	X	X	X	X	X	X	X
	Not familiar with guidelines	X	X	X	X	X	X	X	X	X	X	X	X
	Guidelines unrealistic		X		X	X							
	Guidelines good for long term health		X										
	Binge drinking definition of 8 unrealistic		X		X	X	X				X	X	X
	Don't know binge drinking definition	X	X	X	X	X	X	X	X	X	X	X	X
	Agree with binge drinking definition of 8 units			X									
	Not easy to stick to guidelines					X		X			X	X	
	Alcohol tolerance makes it harder to stick to guidelines					X							
	If you want to monitor your drinking guidelines kind of useful										X	X	
	Use guidelines to calculate AFTERWARDS											X	
	Guidelines useful for drink and driving		X	X			X						
	Know daily AND weekly guidelines		X	X	X								
	Disagree with units of alcohol system			X									
	Not motivated to adhere to guidelines	X	X	X	X	X	X	X	X	X	X	X	X
Individual use of guidelines	Counts drinks not units	X	X	X	X	X		X	X	X	X		X
	Never use guidelines to monitor alcohol intake	X	X	X	X	X	X	X	X	X	X	X	X
	Don't know/understand how many units are in drinks/ too complicated	X	X			X		X	X				
	Use percentage rather than units						X			X			X
Environmental variables influencing alcohol intake	Family tradition	X											
	Responsibilities - Uni work	X		X	X	X	X						
	Being offered drinks/ Buying rounds	X		X	X			X					
	Sport and training		X						X		X		
	Responsibilities - Work		X			X			X	X		X	
	Running out of alcohol		X	X						X			X
	Special Celebrations		X	X	X			X	X	X			X
	hanging out with younger people			X									
	British binge drinking culture			X									
	Less Responsibilities - Freedom at university/ University lifestyle				X	X			X			X	
	Getting older/ Leaving university									X		X	
	Responsibilities – having children									X			
	Commitments the next day									X			
	Friends wanting to go out											X	
	Not keeping alcohol at home											X	

Thank you for your interest in this study of beliefs about alcohol consumption. This survey is designed for people aged 18 and over who have consumed alcohol in the last year.

Participation entails completing an online questionnaire that only takes around 15 minutes to complete.

Participation is voluntary, and you can withdraw from the study at any stage. All information will be treated confidentially. Data will be collected via a secure server and stored in password-protected files at the University of Sussex. Only the researchers will have access to the data.

Everyone who completes the questionnaire will be able to enter a draw for one of four £25 prizes. University of Sussex Psychology students may claim 30 minutes of course credit instead. Either option will require that you give your first name and an email address. This personal information will be stored separately from your answers.

If you would like more information about this study before deciding to take part, please contact:

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School of Psychology
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Falmer BN1 9QH
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By clicking “next”, you are indicating that:
- you consent to the processing of your personal information for the purposes of this research study.
- you understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998

How old are you?

Are you ...

- ◯ female
- ◯ male

In which country do you live?

- ◯ United Kingdom
- ◯ other

Other (please specify)

Are you ... (select as many as apply)

- ☐ Studying - at secondary school / college
- ☐ Working
- ☐ Studying - at university
- ☐ other
- ☐ Studying - at another setting (please specify)

Other (please specify)

If you are studying, which subject(s) are you studying? (If you are a graduate, what did you study?)

- ☐ Medicine
- ☐ Sciences
- ☐ Law
- ☐ Other health profession
- ☐ Engineering
- ☐ Economics / Business
- ☐ Psychology
- ☐ Arts
- ☐ Other / detail

(please specify)

What is your ethnic background?

- ◯ Asian / Asian British
- ◯ Middle / Near Eastern
- ◯ White / White British
- ◯ Black / Black British
- ◯ Mixed Ethnic Group
- ◯ Other (please specify)

Other (please specify)

Which language is used most in your family home?

- ◯ English
- ◯ Other (please specify)

Other (please specify)

What is your religion?

- ◯ no religion
- ◯ Church of England / Anglican
- ◯ Catholic
- ◯ Other Christian
- ◯ Muslim
- ◯ Hindu
- ◯ Buddhist
- ◯ Jewish
- ◯ Other (please specify)

Other (please specify)

Please use the scale below to respond to the following statements

	Strongly disagree	.	Neither	.	Strongly agree
My beliefs about religion are a very important part of my life	◯	◯	◯	◯	◯
My beliefs about religion influence how I make decisions in my life	◯	◯	◯	◯	◯

Please use the scale below to respond to the following statements:

When people drink alcohol...

	No chance	.	.	.	Certain to happen
They have a good time	◯	◯	◯	◯	◯
They are more likely to do something sexual that is risky	◯	◯	◯	◯	◯
They enjoy the buzz	◯	◯	◯	◯	◯
They become aggressive	◯	◯	◯	◯	◯
They have more desire for sex	◯	◯	◯	◯	◯
They are less sexually inhibited	◯	◯	◯	◯	◯
They enjoy sex more	◯	◯	◯	◯	◯
They take more risks	◯	◯	◯	◯	◯
They are more sexually assertive	◯	◯	◯	◯	◯

When people drink alcohol...

	No chance	.	.	.	Certain to happen
They feel ashamed of themselves	◯	◯	◯	◯	◯
They are more outgoing	◯	◯	◯	◯	◯
They do things they would not do otherwise	◯	◯	◯	◯	◯
It is easier for them to socialize	◯	◯	◯	◯	◯
They lose their self-control	◯	◯	◯	◯	◯
They are more energetic	◯	◯	◯	◯	◯
They become clumsy or uncoordinated	◯	◯	◯	◯	◯
They feel relaxed	◯	◯	◯	◯	◯
They behave badly	◯	◯	◯	◯	◯

When people drink alcohol...

	No chance	.	.	.	Certain to happen
They are able to take their mind off their problems	◯	◯	◯	◯	◯
They feel sad or depressed	◯	◯	◯	◯	◯
They feel part of the group	◯	◯	◯	◯	◯
They are less alert	◯	◯	◯	◯	◯
They are more accepted socially	◯	◯	◯	◯	◯
They get sleepy or tired	◯	◯	◯	◯	◯
They are less nervous about sex	◯	◯	◯	◯	◯
They feel sick	◯	◯	◯	◯	◯
They are less shy	◯	◯	◯	◯	◯

On which days of the week do you usually drink? (Please tick days)

- [ ] Monday
- [ ] Tuesday
- [ ] Wednesday
- [ ] Thursday
- [ ] Friday
- [ ] Saturday
- [ ] Sunday

Thinking about the most recent time you drank alcohol, which day of the week was it?

- ◯ Monday
- ◯ Tuesday
- ◯ Wednesday
- ◯ Thursday
- ◯ Friday
- ◯ Saturday
- ◯ Sunday

Thinking about the most recent time you drank alcohol, what did you drink?

Please give as much details as possible, specifying the number and size of drinks (e.g., 2 pints of Stella, 2 large cans of cider, 3 large glasses of red wine, 1 Bacardi Breezer, 1 shot of tequila)

How many units of alcohol do you think you had on this occasion?

# of units

What are the government guidelines for maximum DAILY alcohol intake?

	Units per day
Men are advised to drink no more than ...	
Women are advised to drink no more than ...	

What are the government guidelines for maximum WEEKLY alcohol intake?

	Units per week
Men are advised to drink no more than...	
Women are advised to drink no more than...	

What is the definition of binge drinking?

	Units in one drinking session
For men, binge drinking is having more than ...	
For women, binge drinking is having more than ...	

One unit of alcohol consists of what amount of pure alcohol?

Please use the drop-down menu...	

Please give an answer for each of the following ...

	not at all	.	.	.	Extremely
How familiar are you with the concept of "units" of alcohol?	◯	◯	◯	◯	◯
How useful to you is the concept of "units" of alcohol?	◯	◯	◯	◯	◯
How useful to you would it be to have more information about "units" of alcohol?	◯	◯	◯	◯	◯

How good a definition of binge drinking do you think each of the following is?

	very poor				very good
drinking until feeling drunk	◯	◯	◯	◯	◯
drinking until feeling ill	◯	◯	◯	◯	◯
drinking until vomiting	◯	◯	◯	◯	◯
drinking until losing control	◯	◯	◯	◯	◯
drinking until losing consciousness/ passing out	◯	◯	◯	◯	◯
having a hangover in the morning	◯	◯	◯	◯	◯

How useful has each of the following been as a source of information about alcohol consumption guidelines?

	Not at all				Extremely	* not used
Internet	◯	◯	◯	◯	◯	◯
Newspapers / Magazines	◯	◯	◯	◯	◯	◯
TV	◯	◯	◯	◯	◯	◯
Radio	◯	◯	◯	◯	◯	◯
Billboards	◯	◯	◯	◯	◯	◯
Leaflets	◯	◯	◯	◯	◯	◯
Doctor / Medical practice / Hospital	◯	◯	◯	◯	◯	◯
Information on bottles of alcohol	◯	◯	◯	◯	◯	◯
Friends	◯	◯	◯	◯	◯	◯
Parents	◯	◯	◯	◯	◯	◯
Teachers / School	◯	◯	◯	◯	◯	◯

Other (please specify)

When you are drinking ...

	Never	< half the time	about half the time	> half the time	Always
How often do you count how many units you have consumed?	◯	◯	◯	◯	◯
How often do you use government guidelines to monitor your alcohol consumption?	◯	◯	◯	◯	◯

Please respond to the following questions ...

	Not at all				Extremely
How motivated are you to adhere to the government guidelines when you drink?	◯	◯	◯	◯	◯
How easy would it be for you to adhere to the government guidelines if you wanted to?	◯	◯	◯	◯	◯

For the last week, please fill out HOW MANY UNITS of alcohol you had on each day.

- A pint of strong lager = 3 units
- A pint of ordinary strength lager = 2 units
- A pint of bitter = 2 units
- A large can of beer or lager = 1.5 units
- A regular can of beer or lager = 1.5 units
- A pint of ordinary strength cider = 2 units
- A bottle of wine = 9 units
- A large glass of red or white wine = 3 units
- A medium glass of red or white wine = 2 units
- An alcopop = 1.5 units
- A pub/bar measure of spirits = 1 unit
- A pub/bar mixed drink = 1 unit

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

How did last week compare to an "average" week?

- ◯ I usually drink much less
- ◯ I usually drink a bit less
- ◯ I usually drink this amount
- ◯ I usually drink a bit more
- ◯ I usually drink much more

In the last month, on how many occasions did you ...

... drink more than 6 units of alcohol	
... drink more than 8 units of alcohol	
... get drunk	

What proportion of your drinking occurs in each location listed below?

	None	< half	About half	> half	All
At home	◯	◯	◯	◯	◯
At friends' houses	◯	◯	◯	◯	◯
At parties	◯	◯	◯	◯	◯
In pubs/bars/clubs	◯	◯	◯	◯	◯
Outside (park, beach...)	◯	◯	◯	◯	◯

Other (please specify)

What proportion of your drink purchases occur in each location listed below?

	None	< half	About half	> half	All
Supermarket	◯	◯	◯	◯	◯
Off license	◯	◯	◯	◯	◯
Licensed premises (pubs/bars/clubs...)	◯	◯	◯	◯	◯

Other (please specify)

When you are drinking, how often do the following influence your decision to slow down or stop drinking?

	Never	< half the time	half the time	> half the time	Always
When I feel tipsy	◯	◯	◯	◯	◯
When I feel drunk	◯	◯	◯	◯	◯
When I run out of money	◯	◯	◯	◯	◯
When I have had too many units	◯	◯	◯	◯	◯
When I start slurring my speech	◯	◯	◯	◯	◯
When I start stumbling	◯	◯	◯	◯	◯
When I become aggressive	◯	◯	◯	◯	◯
When I feel sick	◯	◯	◯	◯	◯
When I start vomiting	◯	◯	◯	◯	◯
When I embarrass myself	◯	◯	◯	◯	◯
When my friends suggest it	◯	◯	◯	◯	◯

other (please specify)

How often during last month have you found that you were not able to stop drinking once you had started?

◯ Never

◯ Less than monthly

◯ Monthly

◯ Weekly

◯ Daily or almost daily

What do you think the government guidelines for maximum DAILY alcohol intake should be?

	Units per day
Men should drink no more than...	
Women should drink no more than...	

other (please specify)

What do you think the government guidelines for maximum WEEKLY alcohol intake should be?

	Units per week
Men should drink no more than...	
Women should drink no more than...	

other (please specify)

Do you think there should be separate alcohol guidelines for men and women?

- [ ] Yes
- [ ] No
- [ ] I don't know

Please explain your answer

How would you improve the existing government guidelines for alcohol consumption?

The government has proposed “minimum unit pricing”, which would set a minimum price for each unit of alcohol. The cost of many drinks would increase and offers of very cheap drinks would disappear. What effect do you think minimum unit pricing would have on your alcohol intake?

- ◯ I would drink much less
- ◯ I would drink a bit less
- ◯ No change
- ◯ I would drink a bit more
- ◯ I would drink much more

How much would each of the following proposals reduce the amount you drink?

	Not at all				A lot
Minimum unit pricing	◯	◯	◯	◯	◯
Banning free drink offers (e.g. 2-for-1)	◯	◯	◯	◯	◯
Replacing 24 hour licences with earlier closing times	◯	◯	◯	◯	◯

What proportion of your MALE friends...

	None of them	.	About half	.	All of them
have ever drunk alcohol?	◯	◯	◯	◯	◯
have drunk alcohol in the last month?	◯	◯	◯	◯	◯
have drunk alcohol in the last week?	◯	◯	◯	◯	◯
have ever been drunk?	◯	◯	◯	◯	◯
have been drunk in the last month?	◯	◯	◯	◯	◯
have been drunk in the last week?	◯	◯	◯	◯	◯

What proportion of your FEMALE friends...

	None of them	.	About half	.	All of them
have ever drunk alcohol?	◯	◯	◯	◯	◯
have drunk alcohol in the last month?	◯	◯	◯	◯	◯
have drunk alcohol in the last week?	◯	◯	◯	◯	◯
have ever been drunk?	◯	◯	◯	◯	◯
have been drunk in the last month?	◯	◯	◯	◯	◯
have been drunk in the last week?	◯	◯	◯	◯	◯

Please indicate how often the following statements apply to you

	Very inaccurate		Neither		Very accurate
I'm always prepared	◯	◯	◯	◯	◯
I am the life of the party	◯	◯	◯	◯	◯
I don't talk a lot	◯	◯	◯	◯	◯
I leave my belongings around	◯	◯	◯	◯	◯
I feel comfortable around people	◯	◯	◯	◯	◯
I pay attention to details	◯	◯	◯	◯	◯
I keep in the background	◯	◯	◯	◯	◯
I make a mess of things	◯	◯	◯	◯	◯
I am quiet around strangers	◯	◯	◯	◯	◯
I get chores done right away	◯	◯	◯	◯	◯
I start conversations	◯	◯	◯	◯	◯
I have little to say	◯	◯	◯	◯	◯
I often forget to put things back in their proper place	◯	◯	◯	◯	◯
I talk to a lot of different people at parties	◯	◯	◯	◯	◯
I like order	◯	◯	◯	◯	◯
I Shirk my duties	◯	◯	◯	◯	◯
I don't like to draw attention to myself	◯	◯	◯	◯	◯
I follow a schedule	◯	◯	◯	◯	◯
I am exacting in my work	◯	◯	◯	◯	◯
I don't mind being the centre of attention	◯	◯	◯	◯	◯

Thank you for taking part in this study. The answers you have given will remain completely confidential.

If you would like to be entered into a draw for one of four £25 prizes, please also provide your first name and your email address.
If you are a Sussex Psychology student and would prefer to claim 30 minutes of research participation credit, please indicate below AND give your name and email address.

We will conduct group discussions to examine in further opinions of guidelines for alcohol consumption. These discussion will take approximately one hour and will be conducted at convenient times on the University of Sussex campus. Participants will be reimbursed for their time (Sussex Psychology students can instead claim 60 minutes of research participation credit).
If you would like to take part in a group discussion, please indicate this below AND give your name and email address.

First Name	
Email	
Group discussion? (type "yes" if yes)	
Prize draw? (type "yes" if yes)	
Course credit? (type "yes" if yes)	

The questionnaire was designed to assess people's knowledge about - and opinions of - guidelines for alcohol consumption.
Government guidelines for safe drinking are based on standard "units" of pure ethanol (10mL / 8g). These units of alcohol are the basis for definitions of safe drinking and excessive alcohol consumption.
Recent research shows that many people have inaccurate understanding of these standard units.
For your information, it is recommended that:

• men should drink no more than 3 to 4 units of alcohol per day, and women should drink no more than 2 to 3 units.
• Men should drink no more than 21 units of alcohol per week, and women should drink no more than 14 units of alcohol per week
• There is no agreed definition of "binge" drinking, but a commonly used definition is more than 8 units on a single occasion for men, and more than 6 units on a single occasion for women.

The research is being run by Nina Furtwängler and Dr. Richard de Visser, from the University of Sussex School of Psychology. If you have questions about the study, you can contact Nina (nf62@sussex.ac.uk) or Richard (R.De-Visser@sussex.ac.uk).

If you would like any more information about any of the topics covered in this questionnaire – including information about the number of units of alcohol in different drinks – please contact any of the following organisations.

• NHS Direct
0845 46 47
www.nhsdirect.nhs.uk

• NHS unit calculator
www.nhs.uk/Tools/Pages/Alcoholcalculator.aspx

• Drinkaware
www.drinkaware.co.uk

• Alcohol Concern
020 7264 0510
www.alcoholconcern.org.uk

• Drinkline
0800 917 82 82

• Talk to Frank
0800 77 66 00
www.talktofrank.com